Base Master Plan

Pierce Transit

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1 EXECUTIVE SUMMARY

The 2040 Base Master Plan provides a phased development approach for the Pierce Transit Lakewood Base in order to address the un-met needs of the current fleet and to provide additional capacity for projected fleet growth through 2040. This is accomplished through a series of phased projects that increase the vehicle parking, fuel and wash, and maintenance capacity of the existing base while also bringing these facilities up to contemporary safety and operational standards.

The Lakewood Base serves the entire bus fleet of Pierce Transit, as well as over 100 Sound Transit vehicles that are operated and maintained alongside Pierce Transit buses. The intent of both agencies is to continue this positive relationship for as long as it is feasible and beneficial to both partners.

The planning team was asked to determine the maximum feasible capacity for Pierce Transit and Sound Transit vehicles at the Lakewood Base. Through the course of the study, it became clear that accommodating the combined number of projected vehicles (based on a Pierce Transit aspirational scenario) for both agencies through 2040 was not desirable in the long term. A base of that scale (441 vehicles) would be perhaps one of the largest in the country, and would not be ideally located to efficiently operate some of the anticipated routes. As a result, a long term two-base solution was adopted, with the Lakewood Base destined to serve as the home to as many of the Pierce Transit and jointly-operated vehicles as possible.

The 2040 Base Master Plan provides a road-map for much needed improvements to the Lakewood Base. It provides information on projected fleet and employee growth, space and operational needs, and design criteria for all areas. It details a phased set of projects for each area, and includes an implementation schedule to accommodate the identified needs as quickly as possible. Finally a cost estimate for each sub-project that corresponds with the implementation approach is also provided. The proposed sequence is not absolute, however some projects must precede others in order to maximize capacity in the long term. Explanation of those relationships and the impacts to base capacity is also included.

1.1 MASTER PLAN GOALS

A set of overriding goals was identified by the agency and confirmed by the stakeholder group during the development of the Master Plan Update. These goals and objectives provided a framework for decision making throughout the process, and provide a way to compare options and alternatives. The identified goals are:

- Optimize the use of existing assets, including land,
- Improve the efficiency, safety, and productivity of facility in a cost effective manner,
- Provide flexibility to adapt to industry changes and evolving partner agency needs,
- Be open to new and innovative business practices and work environments,
- Utilize green design principles in site and facility design.

1.2 METHODOLOGY

Working with the group of stakeholders identified by both agencies to represent each of the various functions and needs of the base, the planning team reviewed the existing constraints, identified needs and objectives of each department or area, and developed and adjusted a series of planning alternatives. These alternatives were evaluated with the stakeholders and with the executive teams from both agencies and developed further for review. Finally a preferred alternative was selected. This alternative was developed in detail with project scope, implementation and costs defined.

SPACE PROGRAM TABLE

A detailed space program table was created to track fleet and staff growth, space needs for all functions and maintenance operations, parking counts based on FTE and shift overlaps, and site space requirements for functions such as revenue and non-revenue vehicle parking and fuel and wash. Space standards were generated using industry standard program spaces along with workstation and office standards provided by Pierce Transit.

The space program table is used to predict space, parking, or other needs. A copy of the detailed space program table can be found in Appendix A, and summary tables that are generated by the space program table are found throughout the document.

ACCESS, PARKING AND CIRCULATION

Parking and Circulation are primary considerations for a transit maintenance and operations base. The existing revenue and employee parking areas, circulation and condition were analyzed by the project team. A set of design criteria were developed to guide future development on the base and to develop the preferred alternative. A series of parking diagrams showing the revenue vehicle parking concept for the preferred alternative through each phase were developed with the stakeholders (this can be found in Appendix B). Employee parking needs were evaluated as well, and a projected number of parking spaces was identified by using staffing growth, peak pull, and shift overlaps and agency guidance.

TRAFFIC ANALYSIS

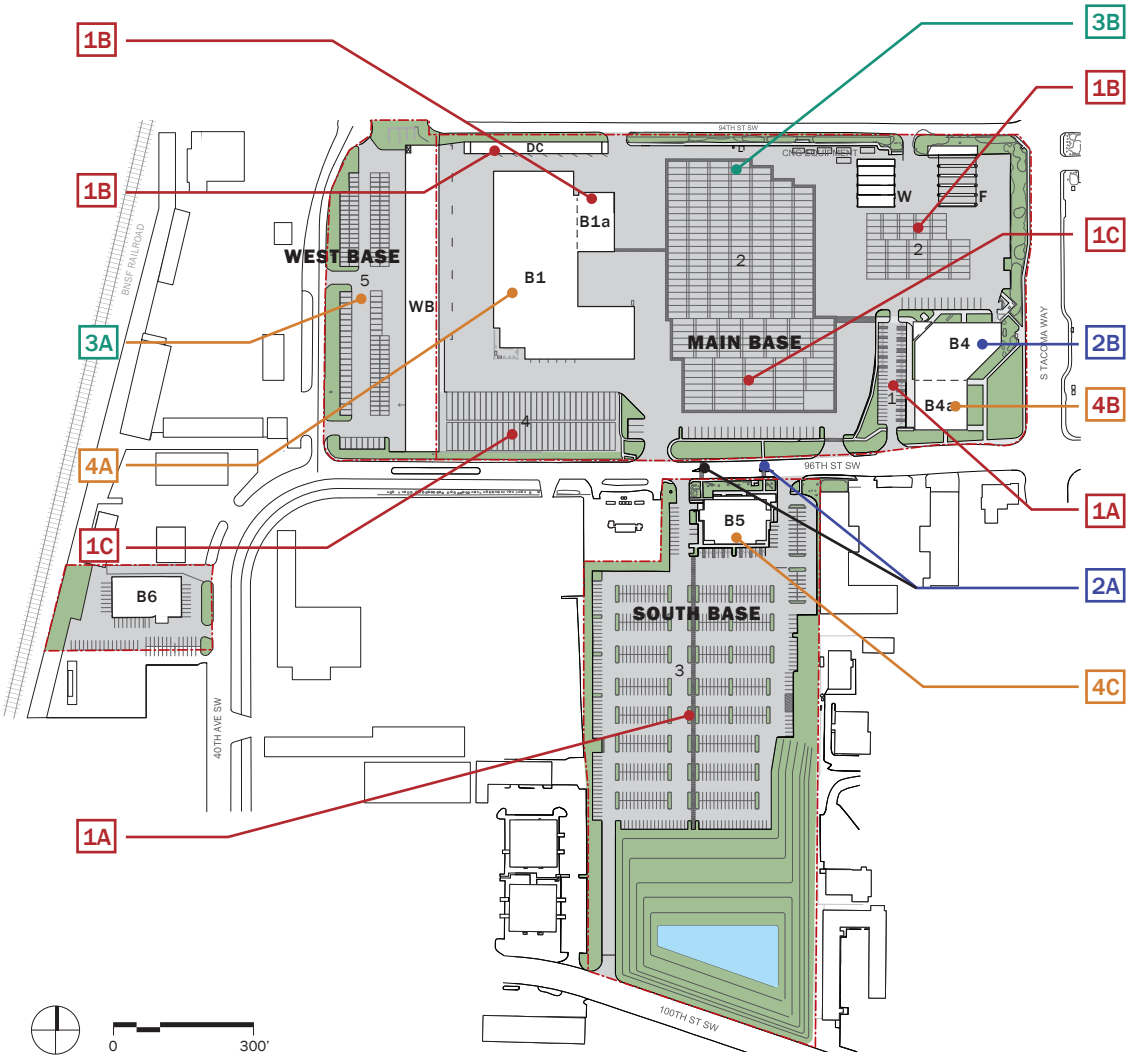
A traffic study was conducted based on the fleet growth projections developed with the Agency. A series of recommendations for improving pedestrian safety at the existing crossings, and the calculated impacts on adjacent intersections was evaluated. A copy of the traffic study will be submitted with the Master Development Plan application and can be found in Appendix E.

PREFERRED ALTERNATIVE

The preferred alternative meets the program goals and objectives in an efficient and pragmatic way. The selected scheme places a high priority on retaining existing buildings and infrastructure to minimize disruption to ongoing operations and retain existing capital investment.

SUB PROJECTS

The selected option was developed further by the project team, and the plan was broken into a series of sub-projects which are described below. Each of the sub-projects can be undertaken as separate construction projects or grouped together depending on Agency preference. For the purposes of the Master Plan Update, the sub projects have been grouped by phase in a logical sequence to minimize disruption to the operating base and maximize vehicle capacity in the near term. These projects also address the identified needs identified during the discovery phase of the planning process (and described in the Facilities Analysis and Site Analysis sections).



PHASES

1A	Building 4 Parking Improvements Expand South Base Parking
1B	Demolish Public CNG and Build New Detail Clean Facility Articulated Bus Bay Addition to Building 1 Expand Bus Parking and New Fuel & Wash and Electric Bus Charging Stations
1C	Regrade and Pave VSR, Bad Order, Surplus Parking Bus Lot Reorientation Restriping and Entry Improvements
2A	Pedestrian Crossing Improvements
2B	Building 4 Work Place Improvements
3A	West Base Facility
3B	Demolish Existing Building 2
4A	Building 1 Renovation
4B	Building 4 Addition and Renovation
4C	Building 5 Renovation

BUILDING

B1	Building 1 - Vehicle Maintenance
B1a	Building 1 Addition - Artic Bays
B4	Building 4 - Admin / Operations
B4a	Building 4 Addition - Admin/Ops/Com
B5	Building 5 - Admin / Training
B6	Building 6 - (Unoccupied)
WB	West Base Maintenance Facility
DC	Detail Clean Facility
W	4-Bay Wash Building w/Chassis Wash
F	5-Bay Fuel Building

PARKING

1	Admin/Visitor Parking (67 spaces)
2	Revenue Vehicle Parking (14' spaces)
3	Employee Parking (647 spaces)
4	VSR/Surplus/Downline
5	Vanpool/Facilities/NRV/Shuttle Parking (187 spaces)

FIGURE 1-1 THE PREFERRED ALTERNATIVE WITH ALL PHASES AND IMPROVEMENTS SHOWN COMPLETED

IMPLEMENTATION SCHEDULE / PHASING APPROACH

There are a total of 14 sub-projects, each of which is described in the Preferred Alternative section. These projects are grouped into 4 major phases of renovation. A detailed Implementation Schedule developed by the team shows one way in which these projects could be completed. This schedule assumes an aggressive timetable, and represents the fastest route to completing all of the sub-projects identified. A copy of the detailed schedule is included in Appendix C, and a summary version is shown in Figure 1-2.

COST ESTIMATE

A conceptual cost estimate for each sub-project was developed, and a detailed breakdown of the assumed construction costs, project and soft costs is included in Appendix D. Each estimate is presented in 2017 dollars, and then an escalation factor is applied based on the Implementation Schedule to calculate the total project cost over time for all phases. GCCM is the assumed project delivery method for the larger phases (phase 1 & 3) and Design-Bid-Build is assumed for the smaller phases that involve singular renovation projects.

The total escalated project cost of all of the sub projects is $165,475,200. A summary is provided in Figure 1-3 showing the cost in 2017 dollars for each sub project and a subtotal by phase.

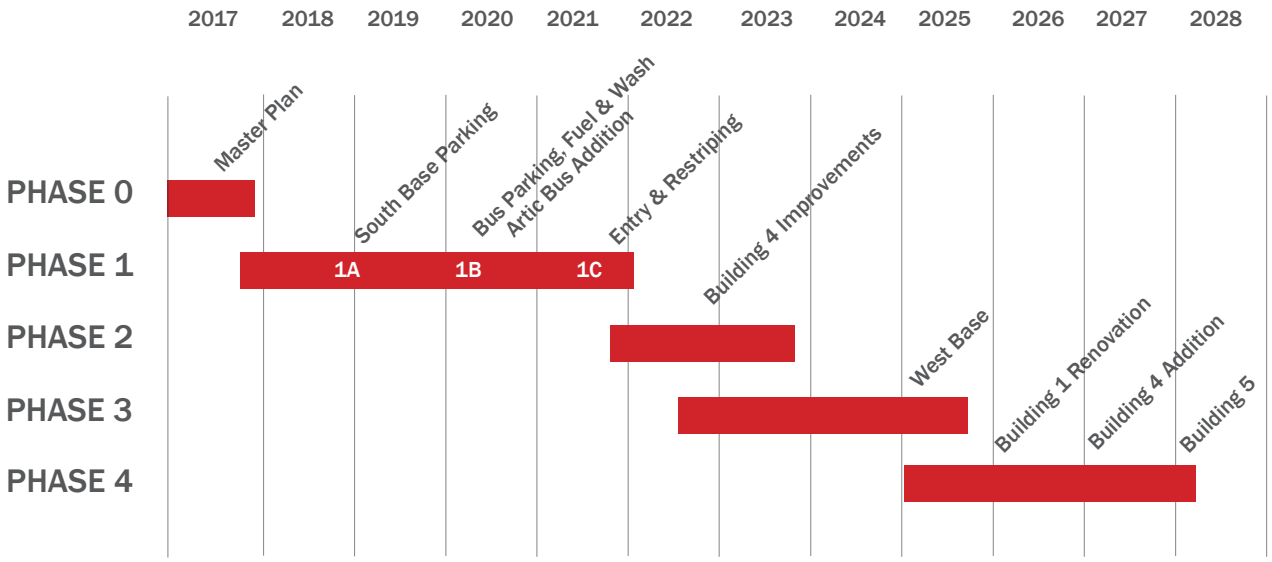


FIGURE 1-2 IMPLEMENTATION SCHEDULE FOR THE PREFERRED ALTERNATIVE

ESTIMATED PROJECT COSTS	2017 Cost	Escalated from Cost by Year
Phase I	**$41,979,927**	**$45,667,939**
1A: Expand South Base Parking	$5,155,742	$5,414,138
1A: Building 4 Parking Improvements	$953,377	$1,007,549
1B: Expand Bus Parking + New Fuel & Wash + 6 Electric Bus Charging Stations	$20,742,792,	$22,637,553
1B: Articulated Bus Bays Addition to Building 1	$6,253,470	$6,775,849
1B: Demo Public CNG & Build New Detail Clean Facility	$3,914,062	$4,293,785
1C: Bus Lot Reorientation & Restriping, Entry Improvements	$646,612	$718,743
1C: Regrade & Pave VSR, Bad Order, Surplus Parking	$4,331,939	$4,820,322
Phase 2	**$5,897,146**	**$6,882,592**
2A - Skybridge	$991,921	$1,131,534
2B - Building 4 Workplace Improvements	$4,905,225	$5,751,059
Phase 3	**$56,829,403**	**$70,250,405**
3A - Building 4 Renovation	$56,402,394	$69,721,701
3B - Building 4 Addition / Comprehensive Renovation	$427,008	$528,703
Phase 4	**$33,030,933**	**$42,674,264**
4A - Building 1 Renovation	$19,680,695	$25,070,362
4B - Building 4 Addition & Renovation	$9,666,675	$12,665,962
4C - Building 5 Renovation	$3,683,563	$4,937,940
TOTAL	**$137,737,408**	**$165,475,200**

FIGURE 1-3 COST ESTIMATE TABLE FOR THE PREFERRED ALTERNATIVE

2 PROJECT BACKGROUND

2.1 OVERVIEW

The following section summarizes the master planning goals, and provides background on the organization as well as relevant prior planning efforts.

MASTER PLAN GOALS AND OBJECTIVES

The planning goals and objectives identified by the stakeholders become the primary measure of success for the master plan. These goals and objectives provide a framework for decision making throughout the process, and provide a way to compare options and alternatives.

PARTNER AGENCIES

The Pierce Transit Lakewood Base is home to both Pierce Transit and Sound Transit vehicles, all serving Pierce County and surrounding areas. The ongoing successful partnership between the two agencies is an important factor in Pierce Transit's interest in expanding and modernizing their facilities. This section describes the two agencies and their relationship.

ORGANIZATION

Pierce Transit is a multifaceted organization, responsible for planning, marketing, operating and vehicle maintenance tasks to serve its mission. Through the course of the study the planning team interviewed each of the departments in the organization. This section outlines the organizational structure of the agency and the role and relationships between departments.

PRIOR PLANNING

The master plan update builds on prior planning efforts. This section highlights the primary planning efforts that have been undertaken on the Lakewood Base and summarizes their relevance to the master plan update.

2.2 MASTER PLAN GOALS AND OBJECTIVES

PIERCE TRANSIT MISSION

"Pierce Transit improves people's quality of life by providing safe, reliable, innovative and useful transportation services that are locally based and regionally connected."

PLANNING GOALS

The following overarching goals were identified by the agency and confirmed by the stakeholder group during the development of the Base Master Plan. These goals and objectives provide a framework for decision making throughout the process, and provide a way to compare options and alternatives.

- Optimize the use of existing assets, including land.
- Improve the efficiency, safety, and productivity of facility in a cost effective manner.
- Provide flexibility to adapt to industry changes and evolving partner agency needs.
- Be open to new and innovative business practices and work environments.
- Utilize green design principles in site and facility design.

MASTER PLAN OBJECTIVES

The following Master Plan objectives were identified by the stakeholder and executive groups to set direction for the master plan itself:

- Identify incremental, event-based facility improvements that can be implemented to address short and long term needs of the agency.
- Provide a road map to reduce congestion and improve safety on the Main Base as quickly as possible.
- Provide a long-term vision to expand base capacity to accommodate the needs of Pierce Transit and Sound Transit,
- Provide a short and long-term vision for investment and improvements to existing base facilities that furthers the identified planning goals.

2.3 PARTNER AGENCIES

Pierce Transit (PT) operates the Lakewood Base, which maintains both PT-owned and Sound Transit (ST) owned vehicles. The Lakewood headquarters and maintenance facility is owned and managed by Pierce Transit.

An operational agreement between PT and ST governs operational and maintenance issues, including maintenance and driver protocols. Capital improvement projects are funded by both agencies and are negotiated individually depending on the relative benefit and needs of each agency in relation to the proposed improvements.

FLEET GROWTH AND PARTNERSHIP

As the demand for public transportation has grown in the recent past, both agencies have increased their fleet sizes, and have exceeded the design vehicle capacity of the Lakewood Base. If this pace of growth continues, the capacity of the base will be exceeded beyond what is possible on the current site.

To address this, and to locate vehicles more proximate to their respective routes, Sound Transit anticipates adding an additional base in the region sometime in the next 10 years. This will lead to a reduction of ST's fleet size as the PT fleet continues to grow at the Lakewood Base.

The ultimate location and mix of ST and PT vehicles is unknown and beyond the scope of the Base Master Plan. Some or all of the ST fleet may leave the Lakewood base, or some or all of the PT and ST fleet may be relocated to a new site.

Both agencies have indicated their commitment to the operational partnership at the Lakewood Base and to developing facilities there to support the current and projected fleet and vehicle types.

PIERCE TRANSIT

Pierce Transit is a Public Transportation Benefit Area Corporation (PTBA) incorporated under authority of Chapter 36.57A of the Revised Code of Washington. In 1979, voters passed a 0.3 percent sales tax to fund public transportation, which also formed the PTBA. In 2002, the voters approved an additional 0.3 percent sales tax to fund transit service, for a total of 0.6 percent currently going to Pierce Transit.

Pierce Transit provides public transport services in the urbanized portions of Pierce County. The service area is 292 square miles, which generally conforms to the county's growth management boundary and contains an estimated 70 percent of the county's population. The service area includes the incorporated cities and towns of Auburn, Edgewood, Fife, Fircrest, Gig Harbor, Lakewood, Milton, Pacific, Puyallup, Ruston, Steilacoom, Tacoma, and University Place along with multiple population centers within unincorporated Pierce County.

Pierce Transit is currently funded through a combination of sales tax revenues, fares and grants.

SERVICES PROVIDED

As the main public transportation provider for Pierce County, Pierce Transit provides a full range of transportation services. These services include local and regional express bus, vanpool, rideshare, special use van programs, and paratransit service for persons with disabilities.

Local fixed routes serve the largest number of customers and consume the largest part of Pierce Transit's budget. These routes are provided on 38 routes travelling throughout Pierce County. Pierce Transit reported over 8.4 million boardings on the local fixed route system in 2016.

Under contract with Sound Transit, Pierce Transit also operates express service to and between many King County locations. These routes accounted for approximately 5.1 million boardings in 2016.

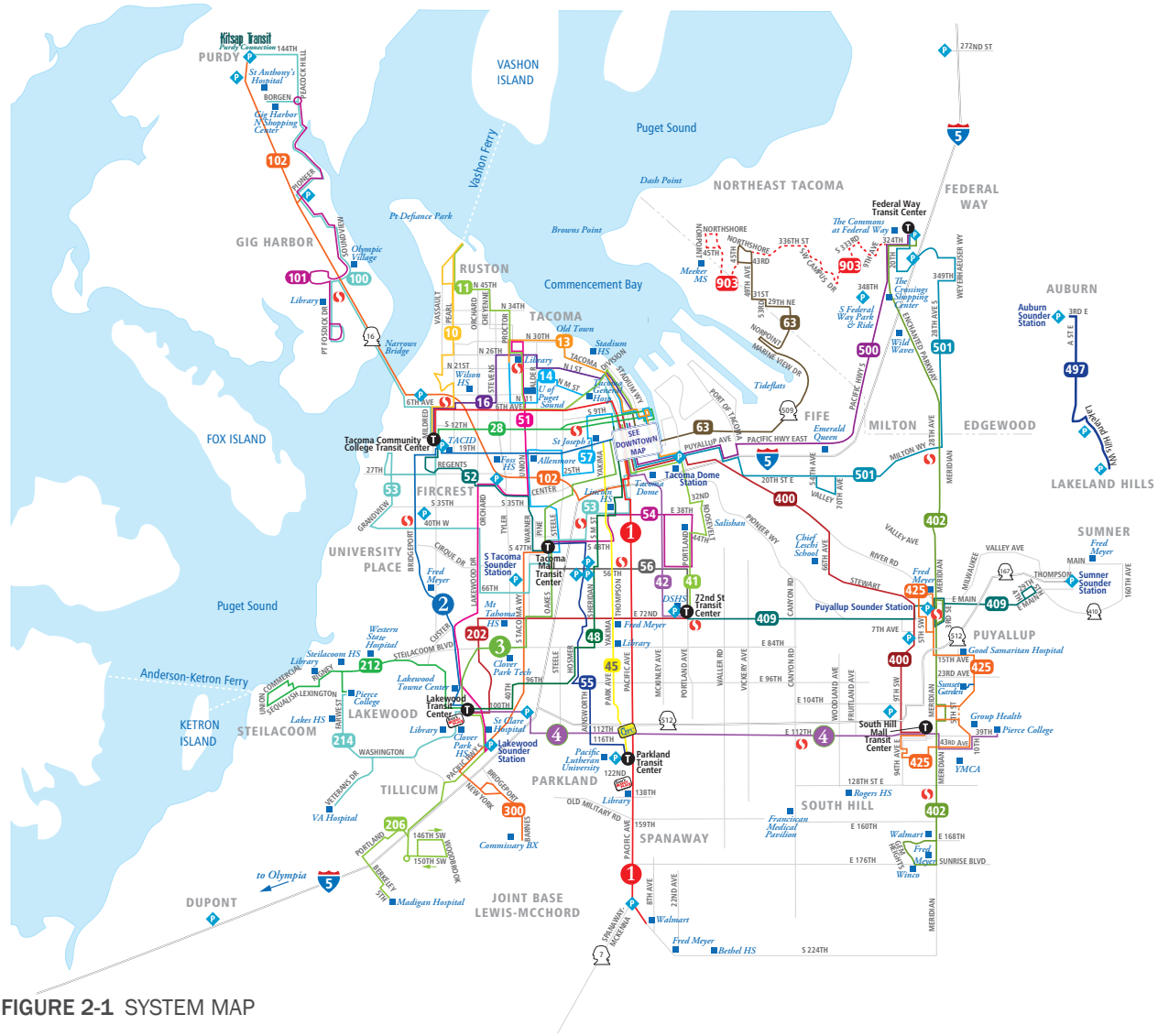


FIGURE 2-1 SYSTEM MAP

2.4 ORGANIZATION

The adopted 2017 budget includes 976 total employees, with hours equivalent to 955.3 full-time equivalent (FTE) employees. The Service Delivery and Support Division which includes support staff and drivers along with the Maintenance Division which includes all maintenance personnel, represent approximately 88 percent of the total positions. The remaining 12 percent are in the Office of the Chief Executive Officer (CEO), Finance Division, and the Administration Division.

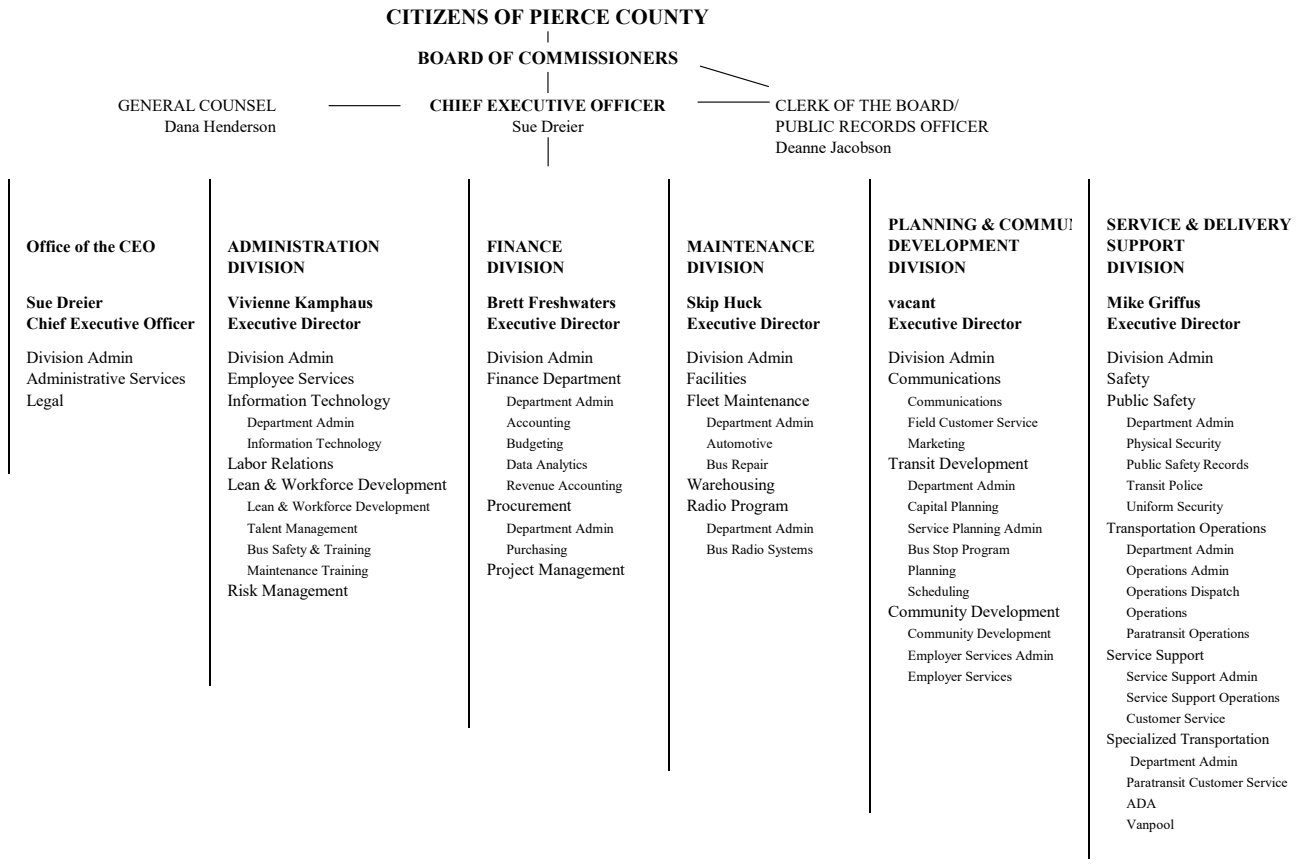


FIGURE 2-2 ORGANIZATION CHART

2.5 DEPARTMENTS

Each department was interviewed during the master planning process to confirm staffing needs, operational issues, and space needs. The following is a brief description of each department and its function within the organization.

LEGAL

This department provides legal advice and counsel to the Board of Commissioners, CEO, Executive Team, and other agency departments and staff on behalf of the agency. The legal department has daily interaction with the Executive Team, CEO, Public Records Officer and Clerk of the Board. The department has frequent (3 or so times per week) interaction with Procurement, Finance, Risk, HR, and Planning. The department has regular (1-2x month) interaction with Public Safety, Facilities, Maintenance, Customer Service, and Operations.

COMMUNICATIONS

The Communications Department manages internal and external communications and media relations for Pierce Transit. They have close involvement with the CEO on various communications including weekly e-mail messages to staff, presentations to groups and organizations, external e-newsletters, and quarterly all-employee meetings. Other duties include managing the marketing department, major writing projects, conducting calls with the media and elected officials, and overseeing duties of the Government and Community Relations Officer.

EMPLOYEE SERVICES

Employee Services provides strategic and functional expertise, support, and leadership to the agency in the following general areas: benefits, compensation, classification, drug and alcohol programming, employee relations, and performance management. The group works with all departments within the organization. The department has daily contact with Service Delivery, which contains the largest number of employees.

EXECUTIVE

The Executive Department includes the CEO, General Counsel, the Clerk of the Board/Public Records Officer and their immediate staff as well as the executive directors of each division. The department along with the division directors assist the CEO in carrying out the day-to-day mission and operations of the agency. The department interacts on a regular basis with elected officials, external customers, and most departments throughout the agency. In addition, the department ensures that the agency meets its legal obligations, is responsible for the preparation and distribution of Board meeting materials, manages public records requests and often deals with sensitive/confidential information.

FACILITIES

The Facilities Department interacts with all other departments in the agency on a regular, and often daily, basis. They provide routine and preventative maintenance service, meeting set up, event support, emergency response for facility and bus stop related issues. Facilities manages the custodial, landscape maintenance, and portable toilet contracts. The department works with staff on office furniture requests, move, add, and change requests for office space and painting. The department also supports the bus stop program including over 2500 stops with approximately 600 that include bus shelters . They install and maintain all of the bus stop improvements including sign installation and changes based on service changes, installation and maintenance of bus stop amenities such as shelters, trash receptacles, and seating.

The department is also responsible for the custodial support of the bus stops and transit centers. That includes the cleaning of all restroom facilities at transit centers, trash pickup, glass cleaning at all bus stops with shelters or trash receptacles.

FINANCE

The Finance Department provides payroll, accounting, general ledger, accounts payable, accounts receivable, grants, auditing, budgeting, and reporting services to the agency. The department staff interacts with bus operators and maintenance and administrative employees in conjunction with payroll, administrative employees in conjunction with budget, IT for printing checks and notice of deposits, the Executive Director of Finance, and the Senior Executive Assistant for Finance and Budget.

INFORMATION TECHNOLOGY

IT interacts with all departments throughout the agency on a daily basis. They support most technology including desktops, servers, software, core business systems, telephones, cell phones, routers/switches/firewalls, network cabling, wireless, CCTV, CCTV on bus, and the ORCA farecard system.

LEAN AND WORKFORCE DEVELOPMENT

The Lean & Workforce Development Department functions as part of Pierce Transit's Human Resources Management System and provides overall direction on Lean & Workforce Development issues and administrative support functions related to the acquisition, training & management of employees for all Pierce Transit divisions & departments. The mission of the department is to be a strategic partner by providing programs that attract, develop, retain, and engage a skilled and diverse workforce. The vision is to be universally recognized for excellence and as a premier employer. In addition to providing strategic workforce development functions, the Lean & Workforce Development Department is responsible for administering the agency's bus operator training program, maintenance training programs, agency-wide training, organizational development, and talent management functions. Further responsibilities include agency coordination of the Pierce Transit Strategic Planning program, the Employee Recognition program, temporary employee services, and diversity & inclusion program.

MAINTENANCE - WAREHOUSE

This department's primary role is inventory management in support of Fleet and Facilities Maintenance. They create and process more than 8,000 purchase orders annually in support of the fleet and facility. They also provide courier service throughout the agency.

MAINTENANCE - FLEET

This department's primary role is repair and maintenance on all of Pierce Transit and Sound Transit buses, SHUTTLE vans, support vehicles, and vanpool vans. Fleet interacts with Operations, SHUTTLE, Vanpool, Radio team, and the Communications Center on a daily basis. Fleet Maintenance also interacts with Safety, Risk, Employee Services, Planning, Finance, Accounting, Training, Marketing, Facilities, Payroll, Public Records, and Public Safety on a weekly basis.

MARKETING

Marketing supports the agency's strategic priorities by providing communications strategy development and coordination of message delivery to many audiences: fixed route, Vanpool and SHUTTLE

passengers, business partners, government and community contacts, the general public, and Pierce Transit staff. They interact frequently with people from across the agency.

SPECIALIZED TRANSPORTATION - OPERATIONS

This department plans the operation of all non-fixed route service, which includes paratransit, Vanpool, Special Use Van program, the Adult Day Health program, and the Van Grant program. The department has daily interactions with fixed route dispatch, fixed route communications center, and First Transit (off-site paratransit contractor). Weekly, the department interacts with IT and Public Safety.

SERVICE SUPPORT

This department provides front line field supervision and radio communication for local and Sound Transit contracted bus service. This group interacts daily with Bus Safety and Training, the Transit Operator Group, Safety Office, Dispatch, Public Safety and Bus and Facility Maintenance. Weekly, they connect with Community Development, Risk, Planning and Marketing.

PROJECT MANAGEMENT OFFICE

The Project Management Office (PMO) oversees capital projects (construction, IT, professional services) for the agency. The resident Project Managers (PMs) manage a large portion of the capital projects, but staff throughout the agency also manage projects ad-hoc, and they are supported by the PMO. On a daily or weekly basis they interact with Procurement, Accounting, IT, Facilities, Transit Development, Grants and Budget. They interact with other departments daily or weekly based on project needs.

RISK

The Risk Department comprises all loss control activities; agency-wide safety; pooled-insurance programs; self-insurance program for workers' compensation; ADA eligibility appeals; Title VI and civil rights complaints; and personal protective/ergonomic equipment supply. Risk and Safety interacts with nearly every group on at least a weekly basis. Operations, Maintenance, Facilities, HR, Training, and the Executive Team are met daily.

SERVICE SUPPORT - CUSTOMER SERVICE

The Customer Service department consists of a call center as well as offering services at a walk-up center located at Tacoma Dome Station. This department sets trip plans for riders, sells fare media, runs the lost and found for Pierce Transit Fixed Route and SHUTTLE service as well as Sound Transit's local Link service and fields most comments for the entire agency. The departments with most frequent contact are the Communication Center, Operations Assistant Managers, Marketing, SHUTTLE, ADA Eligibility IS, Accounting and Public Safety.

ADA / ASSESSMENT

This department conducts and implements ADA-required paratransit eligibility assessments and determinations; individualized and group travel training; and this department also represents the agency in FTA required coordinated transportation activities. Most work involves community contacts, with some ongoing communication with the SHUTTLE service department.

Most interaction is with the public, which includes handling customer phone questions , providing required eligibility notification by mail and seeking medical information from applicant treatment providers. The department brings in just under 1/3 of applicants for in-person physical or cognitive assessments, totaling about 100 individuals per month. Assessors conduct interviews as well as physical assessments twice weekly, all day.

TRANSIT DEVELOPMENT

Transit Development includes fixed route service planning, fixed route scheduling, capital planning and the bus stop program. The department is responsible for short and long-range planning and developing the agency's future.

SPECIALIZED TRANSPORTATION - VANPOOL

The department provides vanpool services supporting the Vanpool vehicles. The staff interacts with the Maintenance team daily. In addition, the staff frequently interacts with Risk Management, Legal, Marketing and the Accounting departments. Vanpool oversees Adult Day Health Express service, a contracted, Demand Response service.

SPECIALIZED TRANSPORTATION - SHUTTLE

The department provides Vanpool services supporting a fleet of 368 vanpool vehicles used by 2400 volunteer vanpool participants. The staff interacts with the Automotive Maintenance team daily. In addition, the staff frequently interacts with Risk Management, Legal, Marketing and Accounting departments. Externally, staff interacts with employer and government contacts. Vanpool customers come to Pierce Transit to meet with staff, receive training, and drop off and pick up vehicles for maintenance, on a daily basis.

PUBLIC SAFETY

The Department of Public Safety is a general law enforcement agency as defined in RCW 10.93.020. The Department interacts and partners with the public, internal and external stakeholders and other law enforcement agencies to provide services for Pierce Transit-owned and operated properties, transit centers, park & rides, & bus routes. Public Safety is comprised of fully commissioned Transit Police Officers, specially commissioned public safety officers, administrative & physical security staff members. Pierce Transit's physical security program addresses building access, CCTV & bus video systems, alarms & gated entry in alignment with Pierce Transit's Public Agency Transportation Plan guidelines.

Note: A detailed breakdown of the number and types of employees can be found in the Facilities Analysis section and in Appendix A.

2.6 PRIOR PLANNING

The following are descriptions of the primary planning and development activities undertaken since the site was initially developed by the agency. Ultimately the most relevant prior planning document is the 2006 Base Master Plan, which is the current Master Use Permit document on file with the City of Lakewood and which the Base Master Plan Update will supercede. Other studies have been referenced with regard to concept planning, and as a starting point for overall goals, staffing and fleet growth projections.

1986 - 1987 BASE CONSTRUCTION (BUILDINGS 1-4)

The construction of the original base footprint on the Main Base property was originally designed as a self-contained facility to serve a fleet of approximately 200 revenue vehicles, including parking, maintenance, administration, and driver areas. This initial phase included the construction of Building 1 (maintenance), Building 2 (wash facility and Facilities maintenance), Building 3 (Fueling and Money-counting/fare collection), and Building 4 (administration).

1999 PIERCE TRANSIT MAINTENANCE/OPERATIONS BASE STUDY, PUBLIC FACILITIES PERMIT AND EIS

This comprehensive study identified all prior minor improvements to the 1987 base, and outlined a conceptual plan for the South Base, Main Base, and Cosmos Site across South Tacoma Way from the Main Base. It also established the initial Public Facilities Permit under the Lakewood Municipal Code, setting the framework for future project-specific conditional use permits to follow. An Environmental Impact Statement (EIS) was prepared for the Public Facilities Permit. This 20-year development plan was submitted to the City of Lakewood and became the Master Development Plan for the site until superseded by the 2006 Base Master Plan.

2002 - 2005 BASE IMPROVEMENTS

Two maintenance bays were added to Building 1 on the Main Base and five acres of parking were built on South Base. The addition to Building 1 was prompted by the need to service and store Sound Transit buses, especially articulated buses. The addition included space for a dynamometer, and additional diagnostic and running repair bays to the east end. Cleaning equipment for outdoor cleaning of vehicles was also added.

Later in this phase, a 26,500 square-foot office and training facility (Building 5) was built on the South Base, addition of pedestrian crossing warning lights were added between the South and Main Base, and there was some expansion of the existing staff parking lot areas.

2005 PLANNING STUDIES

BASE EXPANSION FEASIBILITY STUDY

This study and workshop developed concepts for Main Base vehicle parking improvements; an expansion of the South Base to include an automotive maintenance facility; and a new base on what was then the undeveloped East Parcel owned by PT across South Tacoma Way (Cosmos Site).

STORMWATER OPTIMIZATION PLAN

This study provided direction on how storm water should be handled on all three Pierce Transit base sites (East, Main and South Bases) and examined potential for increased developable area on the South Base (October 2005).

CHARRETTE REPORT ON MAIN BASE GATE AND DRIVEWAY IMPROVEMENTS

This charrette workshop process further developed concepts identified in the 2005 Base Expansion Feasibility Study. This study developed detailed scope for entry gate improvements along 96th St S, entry gates along 94th St South, and driveway concepts connecting the South Base to 100th St S as part of the future South Base vehicle maintenance facility outlined in the 2005 Base Expansion Feasibility Study. The charrette process also addressed administrative functions in both buildings 4 & 5, and included concepts for reorganization and expansion of building 4 to meet growing staff needs.

2006 BASE MASTER PLAN

The 2006 plan was prepared to address the growing facility requirements that came with the growing ST and PT fleets. It satisfied the Conditional Use Permit documentation standards required by the City of Lakewood for the Master Development Plan (MDP). It will be replaced with the current Base Master Plan Update once it is submitted, reviewed and accepted by the City of Lakewood Hearing Examiner.

The MDP Application included the 2006 Base Master Plan and was accepted by the Hearing Examiner on June 19, 2006. This plan remains as the adopted Master Development Plan for the agency (refer to the code summary). The MDP does not technically expire until all the projects projected within it are complete.

The 2006 plan projected base expansion over the 10-year period of 2005-2016. This plan introduced several key concepts including expansion of the revenue vehicle parking lot into the area north of existing Building 4, and an addition to Building 4. Expansion of the South Base footprint included additional parking and a new automotive facility, storm water improvements and a connection to 100th Street S.

The plan was divided into four phases. Of the projects identified, only a few were implemented. Enacted projects included entry gate improvements to the revenue vehicle lot; minor bus lot expansion adjacent to the admin parking lot; and the admin parking lot north entry improvements.

The 2006 plan includes additional documentation to support the proposed development plan. Key additional documentation included: SEPA determination (MDNS), a Transportation Impact Analysis, A Campus Stormwater Optimization Plan and South Base Jurisdictional Letter, Geotechnical Report, US Army Corps of Engineers Jurisdictional Letter, WA State Department of Ecology State Jurisdictional Determination for the South Base Site, and the Hearing Examiner decision and staff report.

The 2017 Base Master Plan Update builds upon these reference documents and re-confirms the relevant storm water and Department of Ecology and Corp of Engineers Waters-of-the-State jurisdictional determinations. Pierce Transit served as the lead agency for the 2006 SEPA submittal.

2008 - 2011 PLANNING STUDIES

2008 SOUTH BASE EXPANSION PLAN

Perteet Engineers led design development drawings of the South Base site and stormwater improvements. Work included a cost estimate and stormwater treatment and detention of proposed South Base parking lot and automotive building. The plan also included a driveway connection to 100th St South. The plan provided a concept level approximation of the amount of area required on the South

Base to provide stormwater management. It included a survey of the significant trees located on the undeveloped portion of the South Base and proposed mitigation and retention plan.

The study provides the basis for 2017 cost estimate for stormwater improvements in this areas (with appropriate contingency and escalation applied.) Ultimately no work was realized as a result of the study.

2009 WEST BASE ST EXPRESS BUS FACILITY CONCEPT STUDY

The first concept for development on the West Base property, this study was completed during the 2009-2011 Base Master Plan Update process (see below). It outlined a plan to develop a separate Sound Transit maintenance base on the West Base and several other surrounding properties. It included a dedicated fuel and wash, maintenance building, employee parking and revenue vehicle parking. No elements of this plan were realized.

2011 BASE MASTER PLAN UPDATE

The most recent master plan update, completed in 2011 by Waterleaf / Pardini / Gannett Fleming was conceived as an update to the 2006 Master Plan. Because the plan was undertaken during the Great Recession at a time of agency staff and fleet contraction, it became limited in scope.

The plan provided a phased approach to accommodate future growth, that could be undertaken sequentially or in response to specific vehicle storage needs or events. The master plan was not submitted to the City of Lakewood as part of the SUP process. Apart from the drivers lobby renovation, very few of the recommendations outlined in the 2011 update were ultimately realized primarily due to economic factors.

DESTINATION 2040

A comprehensive guiding documentation of the agency's vision for its future to 2040 was completed and adopted in 2016. It was an attempt to comprehensively answer the question: "Where do we want to go and how do we plan to get there?" by creating a constrained and unconstrained 2040 blueprint for Pierce Transit.

The Long Range Plan built upon the Strategic Plan for 2015-2020 and the Transportation Development Plan (TDP). It coordinates with other long-range plans authored by other regional transit providers.

The 2040 plan provides direction as Pierce Transit begins developing implementation strategies for capital projects and service improvements over both the mid-term and long-term. It depicts hypothetical fixed-route transit network scenarios for incremental growth, and provides projections that were utilized by the Base Master Plan Update to establish fleet growth projections and staff sizes.

3 SITE ANALYSIS

3.1 OVERVIEW

The following section describes the current uses on the site and the general site characteristics of the Pierce Transit Lakewood Base.

ACCESS AND CIRCULATION

Parking and circulation are primary considerations for a transit maintenance and operations base. The existing revenue and employee parking areas, circulation, and condition were analyzed by the project team. A set of design criteria were developed to guide future development on the base and to develop the Preferred Option.

PARKING NEEDS AND FLEET PROJECTIONS

Vehicles need space to park. Needs in each area were defined and a fleet projection was created in conjunction with the Agency to determine the required parking spaces needed for revenue vehicles. A series of parking diagrams showing the revenue vehicle parking concept for the preferred alternative through each phase were developed with the stakeholders (this can be found in Appendix B). Employee parking needs were evaluated as well, and a projected number of parking spaces was identified by using staffing growth, peak pull, and shift overlaps and guidance.

TRAFFIC ANALYSIS

A traffic study was conducted based on the fleet growth projections developed with the Agency. A series of recommendations for improving pedestrian safety at the existing crossings, and the calculated impacts on adjacent intersections was evaluated. A copy of the traffic study has been submitted with the master plan MUP application and can be found in Appendix E.

INFRASTRUCTURE

A detailed study and analysis of the existing infrastructure is beyond the scope of this study. However, a summary of known information about these systems is included in this section. All new site development areas are assumed to require separate stormwater water quality and detention facilities that meet contemporary code requirements.

APPLICABLE CODES

A description of the land use code constraints, master plan review process and jurisdictional environment is included in this section.

3.2 PROJECT SITE

The project site is the Pierce Transit Lakewood Base, which is made up of four primary areas, the Main Base, South Base, West Base and Building 6 (9622 40th Ave SW) site, as described below. This terminology is used throughout the planning study. A site diagram showing existing conditions and the relative location of these base areas is shown in figure 3-1.

MAIN BASE

The Main Base portion of the site is approximately 19.04 acres in size, and bordered by South Tacoma Way on the East, 96th Street SW on the South, 94th St SE on the north and the West Base parcels on the west.

The Main Base parcels contain Buildings 1-4 of the original bus base, as well as revenue vehicle parking, administrative employee parking and maintenance and visitor parking lots.

SOUTH BASE

The South Base portion of the site is approximately 11.83 acres in size, and bordered by commercial uses to the East and West, an electrical substation to the NW, 100th St SW to the south and 96th Street SW to the north.

The South Base parcels contain Building 5, visitor parking and the primary employee parking lot. The south portion of the South Base is an undeveloped area that was once the site of a gravel mining operation.

WEST BASE

The West Base portion of the site is approximately 3.57 acres in size that is bordered by the Main Base to the East, 96th Street SW to the south, 94th St SE to the north, and 39th Ave Ct SW to the west.

The West Base parcels contain surplus vehicle and other storage parking, and two existing warehouse buildings that are used for Pierce Transit storage, and as “campaign bays” for the changeover of communications equipment on individual buses that are taken out of and brought into service.

9622 40TH AVE SW SITE

This recently acquired property that is approximately 1.06 acres in size that is bordered by 40th Ave SW on the east, commercial properties to the north and South and the BNSF right-of-way to the west.

9622 is currently unoccupied, but will soon contain the Vanpool office function and vehicle parking. A separate utilization study has been completed for this property and is included in Appendix L.

BUILDING LEGEND

- **B1** Building 1 - Vehicle Maintenance
- **B2** Building 2 - Bus Wash & Facilities Maint.
- **B2a** Building 2a - Temporary Storage Building
- **B3** Building 3 - Fuel + Money Counters
- **B4** Building 4 - Admin / Operations
- **B5** Building 5 - Admin / Training
- **B6** Building 6 - Building 6 - Unoccupied
- **B7** Building 7 - Former County Warehouse - Storage
- **B8** Building 8 - Screaming Eagle Storage

EXISTING PARKING

1. Admin Parking (205 spaces)
2. Visitor Parking (12 spaces)
3. Employee Parking (495 spaces)
4. Shuttle Parking
5. Revenue Vehicle Parking
6. Surplus / Downline
7. Employee Parking (84 spaces)

FIGURE 3-1 EXISTING SITE PLAN

3.3 ACCESS AND CIRCULATION

VEHICLE ACCESS

All vehicle access (agency vehicles and private vehicles) is currently from 96th Street SW. The Main Base has four curb cuts onto 96th Street SW. From east to west, the first curb cut is two-way for employees and visitors, the second is for buses entering the site, the third is for bus exit only, and the fourth is two-way for maintenance employees. Delivery vehicle access to the Main Base use the same entry and exit as buses. Ideally, delivery vehicle access should be separated from bus access to improve safety.

Vanpool vehicles and employees access the South Base using two curb cuts. The eastern one is two-way; it provides access to visitor parking and egress from the South Base parking lot. The western driveway provides ingress only for employee and Vanpool (and more recently, SHUTTLE) vehicles.

REVENUE VEHICLE CIRCULATION

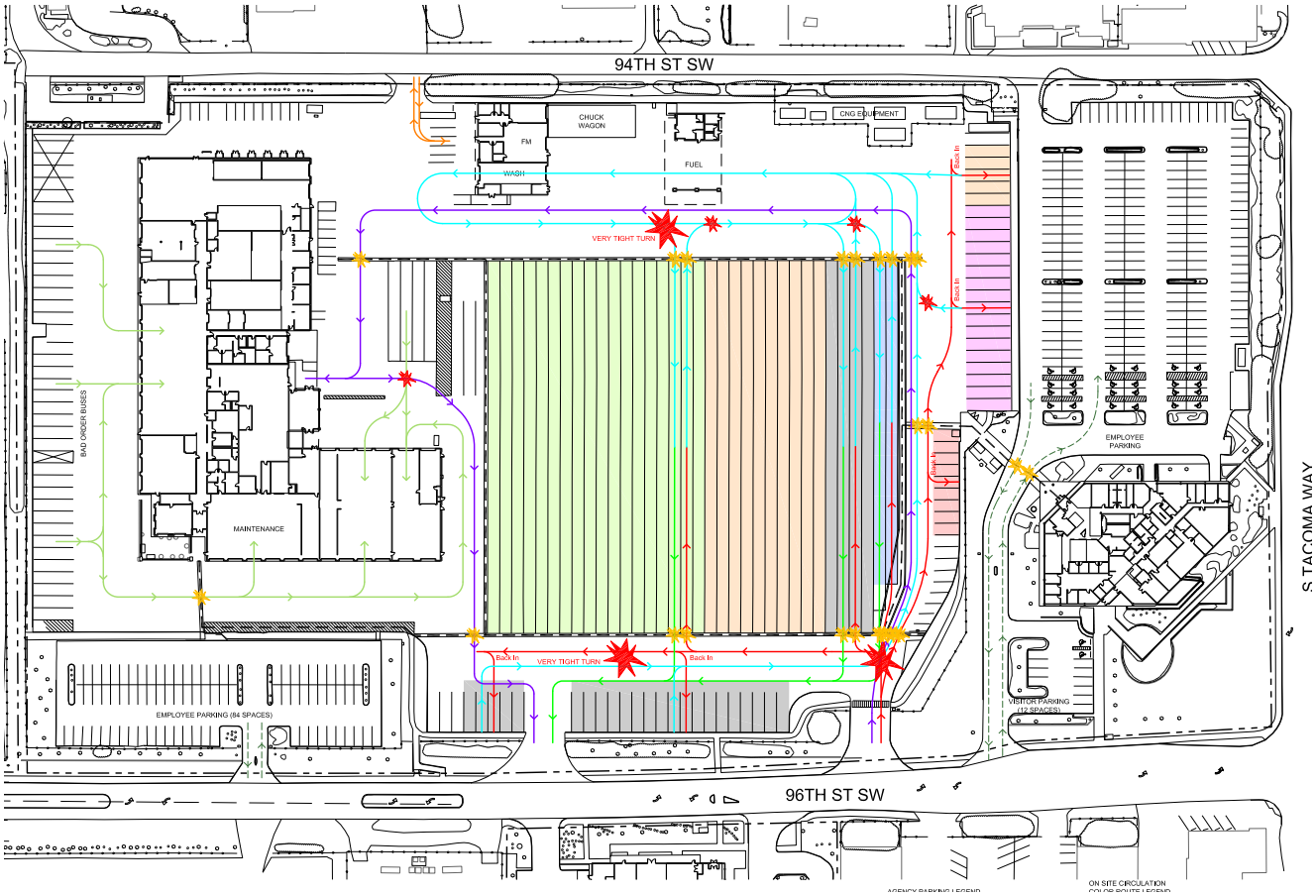
Revenue vehicles include Pierce Transit buses, trolleys, SHUTTLE, and Sound Transit buses as shown and color coded in the Existing Vehicle circulation Diagram (Figure 3-2). Vehicles that park in the main block enter the site and are parked heading north. During the evening service cycle, the service crew drives the vehicles forward, turning as necessary to drive the vehicle through fuel and wash in an east to west direction. After being fueled and washed, the vehicle returns to the main block and is parked heading south.

Vehicles parked along the perimeter enter the site and are pulled into the space (i.e. parked heading toward the curb). During the evening service cycle, the service crew backs the vehicle out of the space, goes through fuel and wash, and the bus is returned to the perimeter parking and backed into the space. Ideally, all backing movements should be avoided to improve safety.

If a vehicle is in need of repair, it is parked in a designated space either along the west wall west of Building 1 or in the VSR parking spaces shown just east of Building 1. After the vehicle is repaired, it is returned to the vehicle parking area.

Bus circulation lanes should be at least 65’-0” wide to accommodate a rolling 90-degree turn into the bus parking lanes. The circulation lane on the north side (between bus parking and fuel and wash) is only 61’-0” and this must accommodate an “S-turn” out of the wash building and into the bus parking lanes. This lane must accommodate buses going to fuel and returning from wash. This movement happens late in the evening and presents additional opportunity for conflicts between pedestrians and other vehicles.

The circulation lane on the south side of the bus parking block is only 56’-6” wide, a full 8’-6” narrower than what is needed for a rolling 90-degree turn. Note that a designated pedestrian walkway is also located in this narrow circulation lane.



AGENCY PARKING LEGEND

- Pierce Transit Bus Plus (25 Ft.)
- Pierce Transit Bus (30 Ft.)
- Pierce Transit Bus (40 Ft.)
- Sound Transit Bus (40 Ft.)
- Sound Transit Bus (45 Ft.)
- Pierce Transit Bus (60 Ft.)
- Sound Transit Bus (60 Ft.)

ON SITE CIRCULATION COLOR ROUTE LEGEND

- BUS: PULL IN
- BUS: NIGHTLY SERVICE
- BUS: PULL OUT
- DAILY DELIVERIES
- VEHICLE MAINTENANCE
- FACILITY MAINTENANCE
- EMPLOYEE / VISITOR
- PEDESTRIAN
- CIRCULATION CONFLICT (VEHICLE / PEDESTRIAN)
- CIRCULATION CONFLICT (VEHICLE / VEHICLE)

FIGURE 3-2 EXISTING VEHICLE CIRCULATION DIAGRAM AND CLASH ANALYSIS

EMPLOYEE & NON-REVENUE VEHICLE (NRV) CIRCULATION

Employee vehicle circulation on the Main Base is separated from revenue vehicle circulation, which improves safety. Access to the two employee parking lots on the Main Base is two-way with a separate access from 96th St SW.

Employee vehicle circulation on the South Base is mixed with van pool vehicle circulation, which is not ideal, but is acceptable to Pierce Transit. Long-term these two functions should be separated.

Non-Revenue Vehicles (NRVs) on the Main Base such as those for vehicle maintenance and facility maintenance, use the same circulation lanes as buses. Facility maintenance NRV's park on the west side of the wash building and along the north fence north of Building 1.

PEDESTRIAN CIRCULATION

Pedestrian circulation paths are clearly delineated on the Main Base with cross hatched walkways painted on the pavement. Unfortunately, these walkways are in the bus circulation lanes, which are too narrow as discussed previously. This creates an undesirable condition for pedestrians that should be avoided if possible in any future configuration.

Pedestrian traffic between the Main Base and the South Base must cross 96th Street SW at grade. Even though there is a pedestrian-activated lighted crosswalk, this can disrupt traffic of employee vehicles, buses, and the general public using this roadway.

ACCESS AND CIRCULATION DESIGN CRITERIA

The following are key criteria for vehicle access and circulation on the site that were used for development of the master plan alternatives:

VEHICLE CIRCULATION CRITERIA

- Bus traffic should be separated from all other vehicle traffic (private vehicles, delivery vehicles, etc.).
- An emergency exit should be provided for buses in case the normal bus entry / exit path is blocked for any reason.
- Bus drive lanes must be a minimum of 65 feet wide to accommodate a rolling 90-degree turn. Ideally, 70 feet or more would be provided. Note that this must be the clear distance (i.e. unencumbered with curbs, bollards or any other obstruction).
- Backing movements by buses in the parking area should be avoided.
- Bus circulation should be counter-clockwise for better visibility during turning movements.
- Bus circulation from bus parking to fuel and wash happens every night for every bus. This circulation must be simple and efficient in order to improve safety and minimize operating costs.
- Bus movements should be one-way to minimize head-on conflicts
- Buses may be stack parked (nose-to-tail), however, it is ideal to limit this to four deep if possible. This would allow access to every bus without moving more than one bus.
- Bus parking and circulation areas must be concrete pavement.
- All paved areas must be properly sloped to drain well.

PEDESTRIAN CIRCULATION CRITERIA

- The gate at the bus entry will be card activated. The gate must be set back to provide for queueing and for a card reader. The gate at the bus exit will be activated by an in-ground traffic loop.
- Five feet should be provided between buses to allow for pedestrian circulation and space for accessing the engine compartment while the bus is parked on the bus lot.
- Employee circulation paths must be clearly delineated and should ideally be separate from any vehicle circulation lanes.
- All parking areas must be properly lit for safety and security.

3.4 VEHICLE PARKING

REVENUE VEHICLE PARKING - EXISTING CONDITIONS

Most of the Pierce Transit and Sound Transit buses are parked in a stacked parking configuration (nose to tail) in a north/south orientation as shown in Figure 3.3. Each sub-fleet (delineated in the revenue vehicle parking diagram by color) is parked in a separate block. Buses are parked from five deep (for articulated buses) to eight deep for 40-foot buses to nine deep for 30-foot buses. Ideally, buses would be parked no more than four deep so that any bus could be accessed by moving no more than one bus. Pierce Transit SHUTTLEs are parked along the east fence of the vehicle parking area as shown. They are typically parked two deep. Some Sound Transit 45-foot buses and the Pierce Transit trolley fleet is parked along the south curb of the bus parking area.

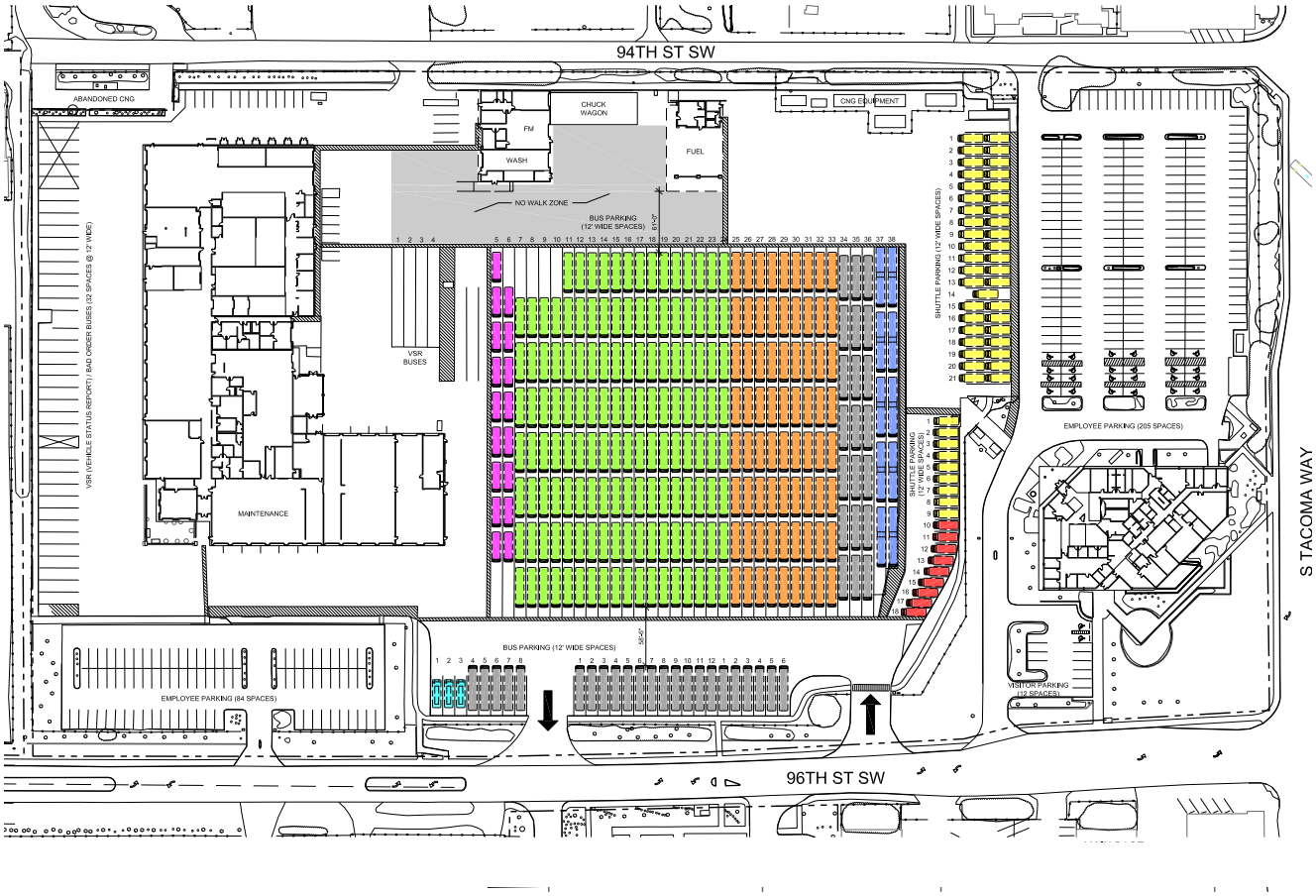
The bus parking area is secured with two sliding gates along 96th Street SW and one sliding gate on the north side to 94th Street SW, however this entry is typically used only for emergency access and occasionally by NRV's (typically for facility maintenance). Bus parking is concrete pavement and is illuminated by high mast lighting.

Bus parking stalls are no more than twelve feet wide, which further exacerbates the tight conditions previously discussed. Drivers are required to exercise the wheelchair ramp as part of their pre-trip inspection. This cannot be done in place with a twelve foot wide stall. Therefore, the driver must pull the bus forward to exercise the ramp and hope that a bus in the row to the right does not collide with the ramp. Twelve-foot wide stalls will not accommodate a charger for an electric bus. Buses are currently parked so close together that it is difficult to fully utilize the AVL system to locate buses on the yard.

REVENUE VEHICLE PARKING - DESIGN CRITERIA

The following are key criteria for bus parking that were used to develop the master plan alternatives:

- Bus parking stalls should all be fourteen feet wide which provides the following advantages:
  - The wheelchair ramp can easily be exercised in-place during the pre-trip inspection. This will "take away the excuses" for not exercising the ramp, thus allowing drivers to easily and regularly comply with established procedures.
  - Space is available for a wide range of electric bus charger configurations.
  - Space is available to accommodate columns to support canopy covering over buses, if desired. The canopy structure could also support solar panels for a more sustainable design.
  - Space is available for providing much better lighting between buses.
- Buses should be spaced far enough apart to fully utilize the AVL system to locate buses on the yard.
- As discussed under the Facilities Analysis (Building 3 – Fuel), the existing fuel lanes do not accommodate a full six to seven-minute dwell time for each bus. This results in most of the interior cleaning being done in the bus parking area under less than ideal conditions. This also makes it difficult to keep the bus parking area clean. This is exacerbated by narrow (12'-0") wide parking stalls, poor lighting, and inadequate vehicle circulation lanes. Cleaning work in the bus parking area creates safety issues and is not as efficient as cleaning under controlled conditions in the fuel lanes. This condition should be avoided where possible.



MAIN BASE

VEHICLE LEGEND

50	Pierce Transit Shuttle (25 Ft.)
9	Pierce Transit Bus Plus (25 Ft.)
3	Pierce Transit Trolley (28 Ft.)
17	Pierce Transit Bus (30 Ft.)
140	Pierce Transit Bus (40 Ft.)
72	Sound Transit Bus (40 Ft.)
44	Sound Transit Bus (45 Ft.)
10	Sound Transit Bus (60 Ft.)

TOTAL: 345

FIGURE 3-3 EXISTING VEHICLE PARKING

EMPLOYEE PARKING - EXISTING CONDITIONS

Employees currently park in one of three designated parking areas. One is north of Building 4 with 204 total spaces. This lot is used by administrative and operations employees and for non-revenue vehicles (there are approximately 32.) Another is south of Building 1 with 84 spaces and is used by maintenance employees. The last is south of Building 5 on the South Base with 207 spaces and is also used by both administrative and operations employees. This is a total of 496 spaces for employees. There are 44 total spaces for visitors including 12 in a lot south of Building 4 and 32 in a lot east of Building 5. Employee parking lots on the Lakewood Base are asphalt pavement, and each lot is fence secured with a card activated gate.

EMPLOYEE PARKING - DESIGN CRITERIA

The following are key criteria for employee parking that were used to develop the master plan alternatives:

- Employee parking should be secure and consolidated as much as possible off the Main Base to provide space for revenue vehicles.
- Vehicle spaces and landscaping must meet the City of Lakewood design standards and requirements for screening, area and plantings.
- Employee parking should be asphalt with fenced perimeter and key-card operated automatic gates
- Employee parking should have clear pedestrian circulation, areas of refuge between aisles, and adequate lighting and visibility throughout.
- Striping should be designated for standard vehicles only. Use for surplus vehicles and other non-employee parking functions should be discouraged.

3.5 PARKING NEEDS AND FLEET PROJECTIONS

REVENUE VEHICLE FLEET PROJECTIONS

Fleet projections for both Pierce Transit and Sound Transit were developed in conjunction with agency planners and analysts, and are roughly based on the Destination 2040 scenarios for aspirational service growth at 3% per year with growth in new areas and additional routes.. Vehicle counts are evaluated by type category, but ultimately converted to Vehicle Equivalents (VE) for the purposes of measuring available parking space. The table below shows the initial revenue fleet projections for Pierce Transit and Sound Transit along with the vehicle equivalent projections. Note that the vehicle equivalent (VE) for articulated buses is 1.5, the VE for SHUTTLEs it is .625, and the VE for all other buses (30', 35', and 40') is 1.0.

The site development alternative preferred by the agency cannot accommodate the entire combined PT & ST fleet on the Lakewood Base. The site capacity of the preferred alternative is approximately 320 vehicle equivalents (VE). If it is assumed that up to 15% of the fleet at any given time is in maintenance or on the bad order line (the designated area for buses waiting for maintenance), the site capacity increases to approximately 368 VE. Still, the site will not accommodate the combined projected fleets of Pierce Transit and Sound Transit on the Lakewood Base.

	2017	2022 5 years	2027 10 years	2032 15 years	2037 20 years	2040
PIERCE TRANSIT						
Standard Buses (30' & 40')	154	148	178	209	245	269
Electric Buses (35' & 40')	6	12	12	12	12	12
Articulated (or Double Decker)	0	27	27	27	27	27
SHUTTLE	33	33	33	33	33	33
Total (Pierce Transit)	193	220	250	281	317	341
Vehicle Equivalents	181	222	252	283	319	343
SOUND TRANSIT						
Standard Buses (40' & 45')	120	120	100	100	80	80
Articulated (60')	10	10	10	10	20	20
Total (Sound Transit)	130	130	110	110	100	100
Vehicle Equivalents	135	135	115	115	110	110
PT & ST COMBINED						
Total (PT + ST)	323	350	360	391	417	441
Vehicle Equivalents	316	357	367	398	429	453

FIGURE 3-4 INITIAL REVENUE VEHICLE FLEET PROJECTIONS BASED ON PT ASPIRATIONAL GROWTH SCENARIO

The capacity issue was discussed at length with the executive teams of both agencies. Ultimately the decision was reached to develop a second base location somewhere else in Pierce County to accommodate this future growth. As both fleets grow, eventually the Lakewood Base would reach capacity and some Sound Transit or Pierce Transit vehicles and routes will transition to the second base location. The following chart illustrates this concept. The point at which the combined PT & ST fleet would reach this capacity is approximately 2027 at the most aspirational growth level of 3% annual growth in service hours. Slower growth rates will result in later dates. A series of alternate fleet growth rates developed by the Agency can be found in Appendix L.

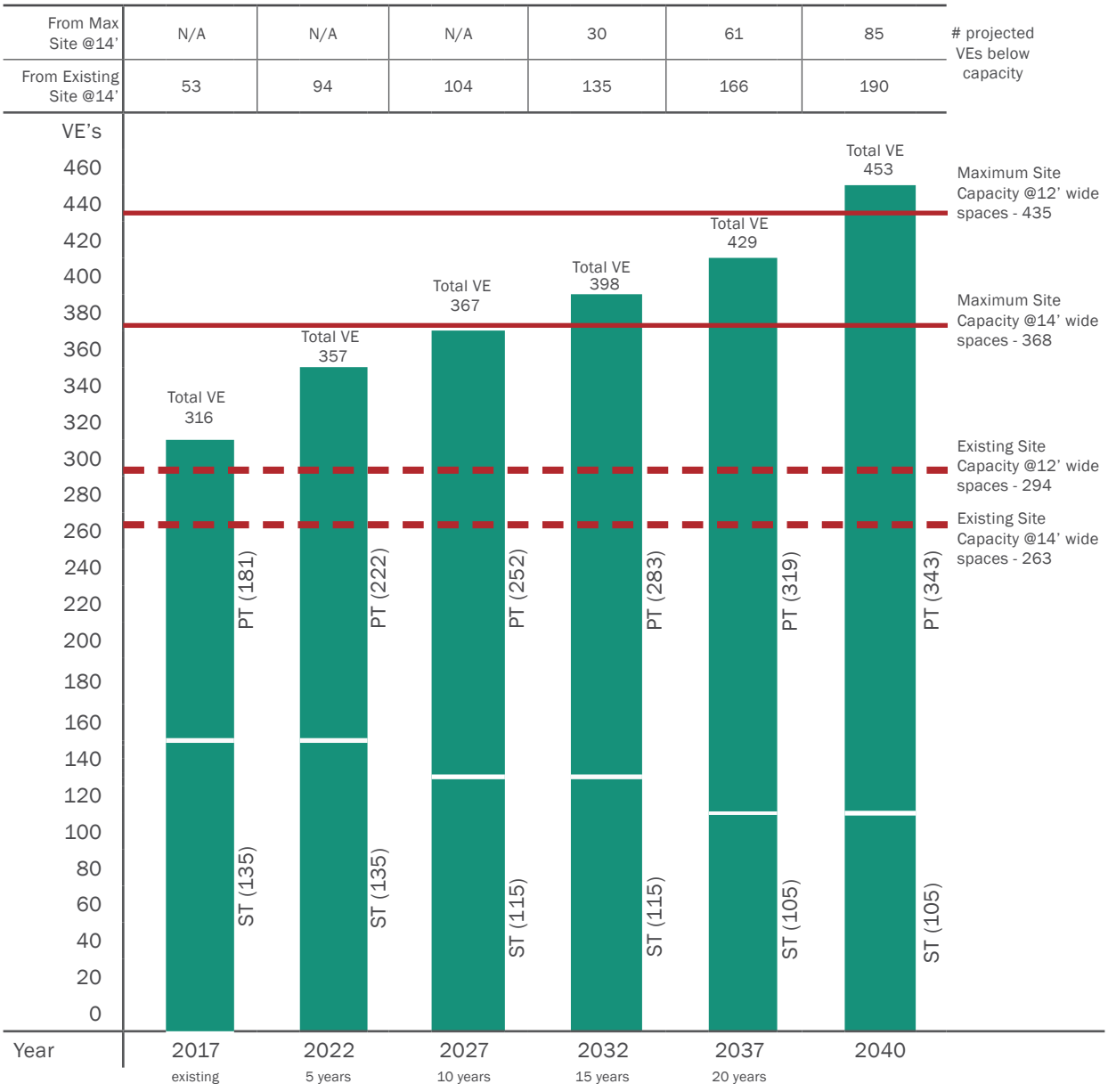


FIGURE 3-5 SITE CAPACITY TABLE - BASED ON VEHICLE EQUIVALENTS

An evaluation of bus parking layouts on the site resulted in establishing the maximum site capacity for active bus parking to be approximately 320 vehicle equivalents, assuming the bus parking area has a space for every bus assigned to the facility and that Building 4 remains. This capacity can be expanded to approximately 368 vehicle equivalents if it is assumed that up to 15% of the fleet is in maintenance or on the bad order line. This number can be further increased if 12-foot wide spaces are used in lieu of 14-foot spacing.

A theoretical fleet projection was developed to align with the actual site capacity of approximately 320/368 vehicle equivalents. This fleet projection was used to develop the detailed space program shown in Appendix A along with staffing and space needs.

In order to fit the projected total fleet shown in Figure 3-4 all on the Main Base, Building 4 would need to be demolished.

Pierce Transit recently made a significant investment in upgrades to Building 4 and has determined that it must remain in the master plan.

As a result the total fleet that can be accommodated at the Lakewood base cannot exceed the maximum site capacity shown on Figure 3-5.

Other fleet growth and fleet mix scenarios between agencies are possible and can be accommodated within the maximum site capacity established by the proposed improvements and parking expansion. The rate of growth in both agency fleets, combined with the interaction with and schedule for the potential second base will dictate the actual number of vehicles on-site over time.

EMPLOYEE / VISITOR / NON-REVENUE VEHICLE PARKING NEEDS

The required number of employee parking spaces was calculated by using the anticipated administrative FTEs, the maintenance employees on-site during the primary shift change, and the maximum number of drivers on-site or out on routes during the peak pull. A detailed analysis of the staffing projections is included in the Program Table located in Appendix A.

The following table summarizes the existing and proposed employee, visitor, and NRV parking required on the site. These spaces will eventually be located as shown under the column labeled "Location". These figures are reflected in the detailed space program shown in Appendix A. The space program is based on input from Pierce Transit. Employee parking for Operators is based on 87% of the bus fleet, which is the current proportion. Employee parking for maintenance is based on the two largest adjacent shifts (day shift plus swing shift). All other employee parking spaces are based on the number of employees in the space program.

Note that handicap parking spaces are included in the figures shown.

EMPLOYEE PARKING	2017	2022	2027	2032	2037	2040	LOCATION
Executive	17	17	17	17	18	18	South Base
Administration	50	61	61	67	74	74	South Base
Finance	27	28	28	28	31	31	South Base
Service Delivery (w/o operators or Van Pool)	68	73	73	78	85	85	South Base
Operators	252	239	234	237	247	268	South Base
Vanpool	9	11	11	12	13	13	South Base or Bld. 6
Planning & Community Development	28	28	28	28	28	28	South Base
Maintenance (w/o Radio or Facilities Maint.)	75	67	75	75	75	80	South Base
Communication Technology	12	16	18	18	18	18	South Base
Facilities Maintenance	25	22	22	22	22	24	West Base
Subtotal Employee Parking	**563**	**562**	**567**	**580**	**611**	**639**	
VISITOR PARKING	20	20	20	20	20	20	Bld. 4 & South Base
NON-REVENUE VEHICLES	**2017**	**2022**	**2027**	**2032**	**2037**	**2040**	**LOCATION**
Executive	79	79	79	79	79	79	Bld. 4 & South Base
Administration	14	14	14	14	14	14	South Base
Finance	1	1	1	1	1	1	South Base
Service Delivery (w/o operators or Van Pool)	25	25	25	25	25	25	West Base
Subtotal NRV Parking	**119**	**119**	**119**	**119**	**119**	**119**	
TOTAL Parking	**702**	**701**	**706**	**719**	**750**	**778**	

FIGURE 3-6 EMPLOYEE / VISITOR / NRV PARKING NEEDS

3.6 TRAFFIC IMPACTS

TRAFFIC STUDY

A preliminary traffic study analysis has been conducted to evaluate the potential impacts on adjacent intersections, and the relative safety of the existing pedestrian crossing. Existing driveway counts were measured through direct observation to establish peak driveway counts for the purposes of the traffic study.

Two components to vehicle trip generation at the Pierce Transit site were evaluated:

- Bus Trips
- Employee/Visitor Trips

Future trip generation was estimated by applying the existing trip generation rates to the anticipated future bus fleet size and the number of employees. The Traffic Study indicates that Pierce Transit's site will generate an additional 18 trips during the AM peak hour and 15 trips during the PM peak hour. These trip generation values were used to determine the level of service delay and pedestrian crossing effects.

PEDESTRIAN CROSSING

The existing pedestrian crossing was evaluated to determine if additional enhancements to the existing crosswalk are needed with the increase in employees with the proposed site development and potential increase in site traffic. The existing pedestrian crosswalk has the following elements and features:

- Painted crosswalk markings
- Center median pedestrian refuge
- Yellow crosswalk warning signs
- Pedestrian push-button activated flashing yellow beacons

Based on the preliminary traffic study (refer to Appendix E) the existing pedestrian crossing safety equipment meets all applicable standards and no improvements are warranted. The Agency has expressed a desire to consider additional enhancements to improve pedestrian safety, regardless of the traffic study findings. As a result, a pedestrian crossing improvements project is included in the Preferred Alternative.

3.7 INFRASTRUCTURE

EXISTING UTILITIES

A detailed investigation of the existing electrical, gas, sewer, water, stormwater or telecom infrastructure was not conducted as part of the 2040 Master Plan Update. The following sections provide a high-level overview of the existing systems and guidance on how these may be incorporated into a future design phase.

These assumptions should be confirmed once the scope of the respective projects is more clearly defined. Evaluation of utility system routing, capacities and configuration to serve the proposed elements of the Master Plan will be conducted on a project by project basis during the design and permit phases.

STORMWATER

MAIN BASE

Much of the existing stormwater infrastructure is original to the initial base development and does not meet contemporary standards for water quality or detention. The existing system consists mainly of a 4,900 linear-foot infiltration trench located below the existing parking lot. The agency has indicated that these systems are regularly maintained and inspected by the City of Lakewood to ensure that they remain operational at the level they were originally intended.

As new areas are renovated and parking lots are modified or expanded, new portions will need to meet contemporary codes and requirements if they exceed 5,000 sf of new Pollution Generating Impervious Surface (PGIS). Because of site constraints on the Main Base, much of this infrastructure will likely require structured detention. Any new areas will need to be separated from a flow perspective from the existing system. Existing systems can remain as long as new work does not exceed 50% of the assessed value of the current facility.

SOUTH BASE

On the South Base, stormwater flows to an existing depression through a series of pipes/ditches and is allowed to spread out over a wide natural area, eventually reaching a depression in the landscape that is a remnant of prior mining operations on the site. The preferred approach to the South Base development includes filling portions of the site to raise grades, including the existing depression area, and building a stormwater pond in the southeast portion of the site to accommodate runoff. This approach was evaluated in 2005 as part of the Base Expansion Study and determined to be feasible at that time.

Some areas of the site have wetland-like features. These were previously deemed by the US Army Corp of Engineers and Department of Ecology to be exempt from “Waters-of-the-State” requirements because of the history of the site and the isolation of these features from other surface water bodies. The agency has requested a jurisdictional determination update for the on-site features prior to the initiation of permitting for the project. A Joint Aquatic Resources Permit Application (JARPA) form has been sent to the U.S. Army Corps of Engineers (USACE) and Washington State Department of Ecology (DOE) to review the information and to conduct a site investigation to re-confirm that the wetland-like features are not considered a water of the U.S. Initial findings indicate that these features will not meet the requirements and will not warrant additional protection of buffer.

WEST BASE

Very little is known about the existing stormwater systems of the two existing West Base buildings. It is assumed that these systems will require a full replacement and reconfiguration when this area of the site is redeveloped.

GAS / CNG FACILITY

The agency has a dedicated Compressed Natural Gas (CNG) facility located on the Main Base that generates fuel for CNG vehicles. This facility is served by Puget Sound Energy. The CNG facility was built in 2005 and underwent major upgrading and refurbishing in 2012 that included the addition of a third natural gas compressor. Major equipment at the CNG site includes three natural gas compressors; a natural gas dryer for pre-treatment of the natural gas prior to compressing and dispensing; compressed natural gas buffer storage bottles; underground storage tanks and fuel dispensing units – three for municipal vehicles and one for public access. The emergency power system includes a 1010kW emergency generator with three automatic transfer switches, one for each compressor.

No changes are proposed to the primary location of the existing CNG facility. As new fueling buildings are brought online, the fuel dispensing will be relocated to the new facility. The existing public access dispenser is no longer in active use and will be demolished with the construction of a New Detail Clean facility.

ONSITE FUEL STORAGE

Diesel fuel and other maintenance related fluids are currently stored in a series of underground tanks located between Buildings 1 & 2 on the Main Base. As the new fueling facilities are brought online these existing fuel tanks will be decommissioned in place and replaced. Maintenance fluid storage will also be relocated.

3.8 APPLICABLE CODES AND REGULATIONS

CITY OF LAKEWOOD MUNICIPAL CODE (ZONING AND LAND USE)

SUBJECT PARCELS

The existing transit base operation is located on seven separate parcels in the City of Lakewood, WA. The base is separated into three primary areas as indicated previously.

ZONING OF SUBJECT PARCELS

The zoning designation for the subject properties varies. The Main and South Base parcels are designated as Public/Institutional (PI) zone whereas the West Base parcels are designated as Industrial One (I1) zones, and the parcel at 9622 40th Ave SW is designated Commercial (C2). For the purposes of this review, it is assumed that the underlying designation on the West Base parcels and 9622 40th Ave SW can be aligned with the intended use (PI). This approach was confirmed by city staff at the Pre-application meeting held on May 4th, 2017 and follow up emails. The city staff confirmed that the West Base and 9622 40th Ave SW properties would be allowed to be incorporated into the master plan without the need for a zoning change, assuming that the transit base use is allowed in the zone.

USE CLASSIFICATION (LMC 18A.20.400)

The Pierce Transit bus base can be classified as a "**Transportation Level 4**" use, under the Lakewood Municipal Code. This use is described as a public or semi-public transportation service (Transportation). The Level 4 designation corresponds with the following description: "Taxi, SHUTTLE, and bus "barns" and yards, and motor pool facilities".

ESSENTIAL PUBLIC FACILITY DESIGNATION (LMC 18A.20.400.D)

Under the state Growth Management Act, essential public facilities include: *those facilities that are typically difficult to site such as airports, state education facilities and state or regional transportation facilities as defined in RCW 47.06.140.* The Pierce Transit base can be considered to be an Essential Public Facility (EPF) under this definition and for the purposes of this code. A public facilities master plan is required for all Essential Public Facilities uses which utilize contiguous parcels of land totaling twenty (20) acres or more and which are zoned Public/Institutional. Because of this designation and the size of the existing and proposed base, the master plan update will need to be submitted and reviewed by the City of Lakewood prior to undertaking any major projects on the site, as outlined below.

PUBLIC/INSTITUTIONAL ZONE (P/I) REQUIREMENTS (LMC 18A.30.800)

The Main and South Base areas are entirely located within the PI zone. The Pierce Transit facility is classified as a Transportation Facility (Level 4), and is not allowed outright under this zone, but is allowed as a "essential public facility" per LMC 18A.30.830 – A.1.b. This provision allows the use, subject to a discretionary land use permit and all applicable development permits as determined by the Community Development Director. To establish the provisions that will be applied to future significant development on the base, a consultation meeting with the City of Lakewood Community Development Director will be required.

If the Community Development Director determines that this is an **essential public facility** (per LMC 18A.20.400.D) then future development will be subject to approval of a discretionary land use permit and all applicable development permits. Any proposed use, whether new or an expansion or change of an existing use, shall be evaluated individually to determine whether it will be treated as an administrative or conditional use, based on its size, overall functions, and anticipated level of impact, including, but not limited to, such factors as hours of operation, relationship to adjacent land uses, trip generation and parking needs, storage needs, and environmental impact.

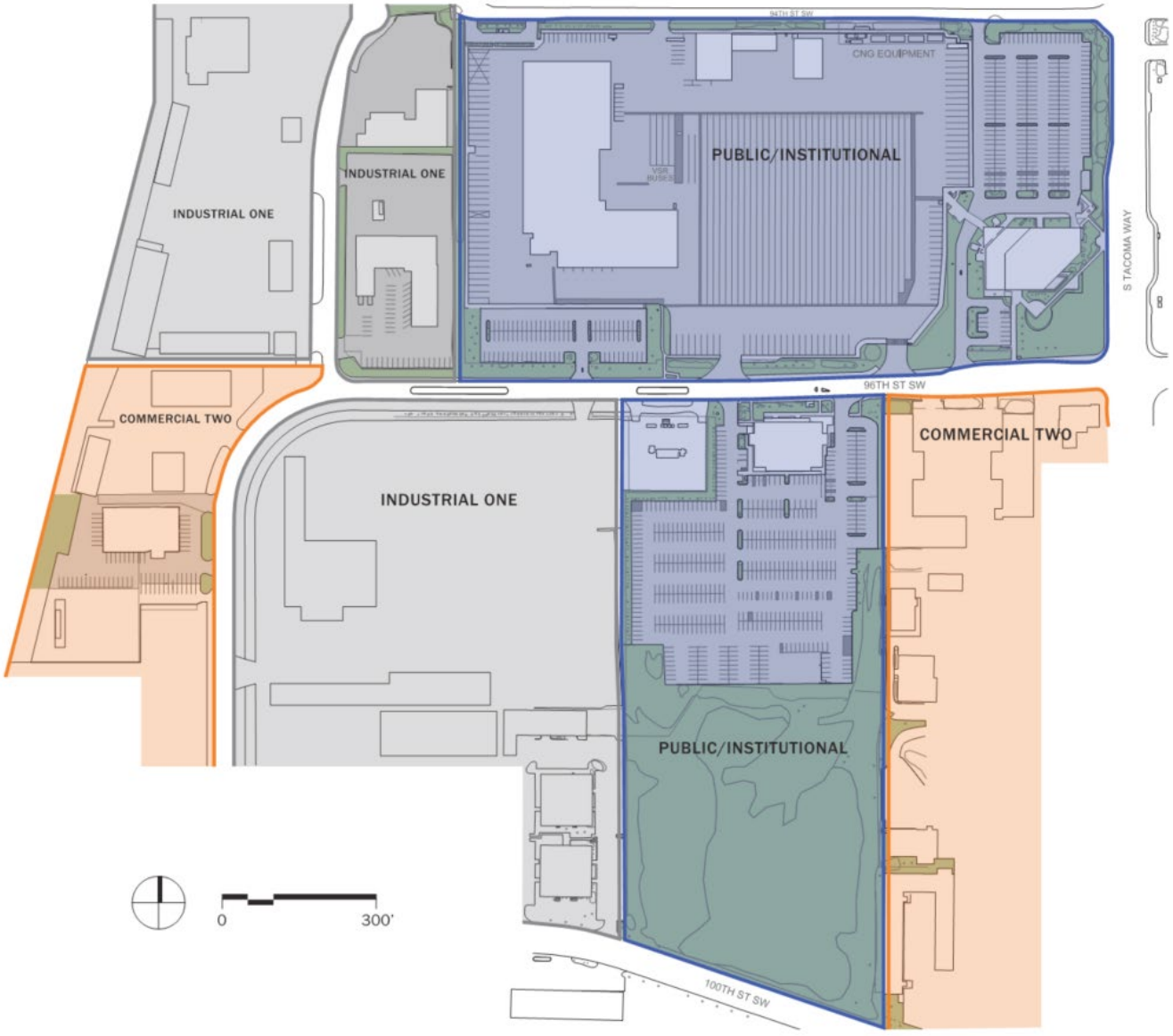


FIGURE 3-7 SITE PLAN WITH ZONING / EXISTING ADJACENT USES

DEVELOPMENT STANDARDS IN THE P/I ZONE (LMC 18A.30.840)

Because of the nature of the typical uses characterizing this use type and the high need for flexibility in siting and operating public facilities, the code states that general development standards shall be determined jointly by the Community Development Director and City Engineer on a case-by-case basis. Establishment of these standards and review and approval are done through an update of the Public Facilities Master Plan, as defined below. In addition the proposed development must meet the baseline requirements for design features, tree preservation, landscaping, parking and signage as defined in the code and summarized below.

Master-Planned Facilities

Public/Institutional uses on properties twenty (20) acres or larger in size which are located within the Public/Institutional zoning district must undertake a public facilities master plan pursuant to LMC 18A.30.850, which must be reviewed and approved prior to issuance of permits for any proposed development. The following development standards apply:

1. SEPA Lead Agency: Unless specifically released on a case-by-case basis, the City hereby reserves lead agency status for environmental review under the State Environmental Policy Act for any and all uses within Public/Institutional zoning districts.

2. Design: Design features shall be required as set forth in LMC 18A.50.200, Community Design.

3. Tree Preservation: Significant tree identification and preservation and/or replacement shall be required as set forth in LMC 18A.50.300, Tree Preservation.

4. Landscaping: Landscaping shall be provided as set forth in LMC 18A.50.400, Landscaping

5. Parking: Parking shall conform to the requirements of LMC 18A.50.500, Parking.

6. Signs: Signage shall conform to the requirements of LMC 18A.50.600, Signs.

PUBLIC FACILITIES MASTER PLAN (PFMP) STANDARDS - P/I ZONING DISTRICT (LMC 18.30.850C)

As defined in the Lakewood Municipal Code, the purpose of the Public Facilities Master Plan (PFMP) process is to encourage Essential Public Facilities / Civic uses on large parcels of land to be developed holistically, with internally compatible uses and physical development and with accommodations made for natural site and environmental conditions, assuring that:

1. *Appropriate provisions are made for water, sanitary sewer, drainage ways, utilities, roadways, emergency services, and any other applicable infrastructure or services;*

2. *Critical areas will be protected;*

3. *Usable open space will be provided;*

4. *Appropriate provisions are made for motorized and non-motorized transportation circulation, including sidewalks and other planning features that assure safe walking conditions for students who walk to and from school;*

5. *Approval criteria and mitigation measures are established which include general design elements and linkage components; and*

6. *The safety of the general public as well as workers at and visitors to the facility is ensured.*

Applicability

A Public Facilities Master Plan (PFMP) is required for all Essential Public Facilities (Civic) uses which utilize contiguous parcels of land totaling twenty (20) acres or more and which are zoned Public/ Institutional. The Pierce Transit Base satisfies both criteria.

Minor projects can be undertaken without a master plan update. Any significant new uses not included in the approved (PFMP) shall not be allowed on the site except by review and approval of an amended (PFMP) following the same process as establishment of an initial (PFMP).

Compatibility Study

When a new Essential Public Facility/Civic use is proposed which requires a (PFMP) or an amendment to an existing plan and it is located on the same property or site of an already established Essential Public Facility/Civic use, the city shall require the project proponent to prepare a compatibility study which, at minimum, contains the following information on a form prescribed by the city:

1. *The purpose of the proposed Essential Public Facility/Civic use;*
2. *An operational characteristics description of the proposed Essential Public Facility/Civic use and an operational characteristics description of the existing use or uses;*
3. *An evaluation of the potential effects of the proposed Essential Public Facility/Civic use upon the existing use or uses;*
4. *An evaluation of the potential effects of the proposed Essential Public Facility/Civic use upon the adjacent properties;*
5. *An evaluation of the potential effects of the proposed Essential Public Facility/Civic use upon at-risk or special needs populations, including but not limited to children and the physically or mentally disabled; and*
6. *Identification of any applicable mitigation measures designed to address any potential effects identified through the evaluation required herein.*

Previous Permits

A previously adopted public facilities permit, or a previously adopted administrative use or other permit issued pursuant to Title 18 or 18A LMC may constitute an adopted (PFMP) for the purposes of fulfilling the requirements herein. Any subsequent amendment(s) sought to an existing public facilities permit shall follow the process for a (PFMP).

PFMP Update Process

The proposed changes to the Base Master Plan constitute new projects that were not previously approved under the PFMP process. Because of this, the (PFMP) shall be reviewed as a Process III permit type under LMC 18A.02.550, and a new Master Plan Report and Compatibility Study will need to be generated to update the existing master plan. The code states:

Recognizing that the nature of essential public facilities often requires approval of significant capital appropriations and that the appropriations process may be unpredictable, a public facilities master plan typically would not expire unless and until the slate of projects to be completed thereunder has been substantially completed, and new projects that are not included in the scope of the public facilities master plan are proposed. In such case, the proponent shall undertake an update which shall follow the same process as an initial public facilities master plan.

PROCESS III PERMIT TYPE (LMC 18A.02.550)

Process III procedures are used to process Conditional Uses; Variances, and other permits and uses as indicated in Table 3 of LMC 18A.2.502. Under Process III, an application is scheduled for a public hearing before the Hearing Examiner. Process III procedures require notification of adjacent landowners, and affected parties, all of whom are invited to comment on the proposal in a public hearing. The following steps are required:

Permit III Process Steps

1. *Notice of application shall be provided to the public, pursuant to LMC 18A.02.670-675.*
2. *Notice of public hearing shall be provided to the public, pursuant to LMC 18A.02.700.*
3. *A staff report shall be provided to the public, pursuant to LMC 18A.02.710.*
4. *The public hearing shall be conducted, pursuant to LMC 18A.02.720.*
5. *At the public hearing, City staff, the applicant, and interested persons may present information relevant to the criteria and standards pertinent to the proposal, give reasons why the application should or should not be approved or propose modifications and state the reasons the person believes the modifications are necessary for approval.*
6. *The Hearing Examiner may attach certain development or use conditions beyond those warranted for compliance with the Land Use and Development Code standards for the permit type in granting an approval if the Hearing Examiner determines the conditions are necessary to avoid imposing burdensome public service obligations on the City to mitigate detrimental effects to others where such mitigation is consistent with an established policy of the City and to otherwise fulfill the criteria for approval.*
7. *A decision of the Hearing Examiner is final.*

Once the Application is submitted, this process typically takes 10-12 weeks to final approval. A hearing date is issued and public comments are collected on the initial application. A staff report is generated and a notice of public hearing is published between 15-30 days prior to the hearing date. Ideally SEPA review should also run concurrently with the amendment application so that the threshold determination can be in place by the time of the hearing.

INDUSTRIAL ONE (I1) ZONE

The West Base parcels are designated as Industrial 1 (I1) zone. The (I1) zoning district provides for regional research, light manufacturing, warehousing, concentrated business/employment parks, and other major regional employment uses. These industrial lands are the primary working areas of Lakewood, integrated into the community economically and environmentally while maximizing a regional economic presence based on Lakewood's geographic position. The proposed use can be classified as a Transportation Level 4 use in the I1 zone, and is allowed subject to a conditional use permit (master plan).

Development Standards – Industrial One Zone

The industrial zone includes minimal design standards. The minimum lot size is 20,000 sf. The lot coverage maximum is 100% (fully covered) as long as stormwater facilities are provided. Setbacks for the front yard is 10 feet, all other sides are set to 0 feet. Building height is limited to 60 feet. Requirements for community design, tree preservation, landscaping, parking, and signage are identical to those required in the P1 zone (and described below).

COMMUNITY DESIGN REQUIREMENTS (LMC 18A.50.200)

Community Design requirements apply to all new development in any zoning district. Additions and exterior changes are subject to the provisions of Community Design that are determined by the Community Development Director to be reasonably related and applicable. Projects that modify parking and landscaping areas are also subject to site design standards for pedestrian access, safety and landscaping. In the Industrial Zone, there are a prescriptive set of requirements that address these topics. In the Public Use (P1) zones this standard is deliberately flexible, and the Community Development Director may apply the general standards as deemed applicable based on a review of the application materials. In general the primary applicable standards will relate to landscape screening, preservation of significant trees where possible, and design of building elements to highlight or communicate a cohesive aesthetic.

TREE PRESERVATION REQUIREMENTS (LMC 18A.50.300)

Tree preservation standards are intended to promote protection of “significant” trees both at the perimeter and the interior of development sites. Sizes based on tree species establish the size that must be considered, and any permit involving site development must submit a Tree Retention Plan that identifies all significant trees, indicates which are to be removed, and provides a landscape plan for replacement at the ratios identified in the section for the location and species.

These requirements will become particularly relevant to the development proposed on the South Base parcel, as there are a number of trees in that area that will meet the size standard. Offsite replacement and payment in-lieu-of are also potential options for compliance with this section or a permit by permit basis.

LANDSCAPING REQUIREMENTS (LMC 18A.50.400)

This chapter codifies a series of landscape types corresponding to different landscaping objectives that may apply to a particular site. This section may be applied on a discretionary basis during land use review of a project. The only required standard for landscape in the PI zone is a requirement for a 10’ wide Type I vegetative buffer at the site perimeter. Standards for Area Screening (Type VI) will likely be applied to areas such as the revenue vehicle parking expansion, and fuel and wash. Standards for Parking Area landscaping (Type IV) will be applied to the South Base parking expansion. In the master plan all existing landscape screening areas along South Tacoma Way are retained.

PARKING REQUIREMENTS (LMC 18A.50.500)

This section regulates parking and loading activities to improve circulation and set standards for parking ratios and parking spaces. This standard is applicable only to the employee parking areas and would not apply to revenue vehicle parking or operations.

Per the parking standard, there are three applicable parking count measurements that may apply:

- Parking spaces required by the use: for Transportation Level 4, a minimum of one space per commercial vehicle is required.
- For the office areas incident to the use, a requirement of one (1) parking space for each two hundred fifty (250) gsf of office use is required.
- For all developments: the number of employee spaces required shall be based on the maximum number of employees who may be on-site at any one-time.

For the purposes of the master plan update, the number of employees on-site at any given time is the controlling ratio. This number was calculated using administrative FTE's, a ratio for drivers on-site during peak-pull, and a count of maintenance employees on-site during overlapping shifts. Refer to the Vehicle Parking section below for additional information.

SIGNS REQUIREMENTS (LMC 18A.50.600)

Regulates the types and content of site signage that can be placed or modified. No specific standards are identified within the P1 use and the Development Director has full jurisdiction regarding sign type, size and location.

STATE ENVIRONMENTAL POLICY ACT (SEPA)

Concurrent to the master plan update application, the Agency will prepare a SEPA environmental checklist to determine whether the environmental impacts of the proposal are significant. The checklist will be completed for all parts of the proposal, regardless of where they occur in the phasing plan. The City of Lakewood will allow the Agency to take lead agency status for the SEPA review and determination (as confirmed at the Pre-application meeting on May 4, 2017).

Based on the previous master plan, a Mitigated Determination of Non-significance (MDNS) is a likely outcome for this scope of work. The lead agency (Pierce Transit) will work with the City of Lakewood during the public notification period to develop the specific mitigation measures required based on the contents of the application. The previous 2006 Master Plan included mitigation measures related to the evaluation of potential waste and landfill gases present at the South Base, adjustments to signal timing and other queuing areas identified in the Traffic Study, and more conservative design parameters for the South Base stormwater pond based on low infiltration rates. A similar set of mitigation measures should be anticipated for the Master Plan Update.

Given the scope of the project it is unlikely that an Environmental Impact Statement (EIS) will be required under RCW 43.21C.030(2)(c). No additional review or processing time for a full EIS has been included in the Implementation Schedule.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) FEDERAL REQUIREMENTS

Depending on the extent of federal funding that is anticipated, parallel compliance with federal NEPA review may also be required. While many provisions of the SEPA process parallel the NEPA review process, there are some significant differences and a separate application and review process must be undertaken in collaboration with the Federal Transportation Authority (FTA) which is the federal agency with jurisdiction within this use.

A full review of the NEPA requirements, and categorical exemptions is outside the scope of this study.

JOINT AQUATIC RESOURCES PERMIT APPLICATION (JARPA)

Some areas of the existing South Base site have wetland-like features. These were deemed previously by the US Army Corp of Engineers and Department of Ecology to be exempt from "Waters-of-the-State" requirements because of the history of the site and the isolation of these features from other surface water bodies. This determination was confirmed in 2005 and expired 10 years later in 2015.

The agency has requested an updated Jurisdictional Determination for the on-site features prior to the initiation of permitting for the project. A JARPA form has been sent to the U.S. Army Corps of Engineers (USACE) and Washington State Department of Ecology to review and confirm the designation. This will involve a site visit by DOE at a future date. Initial findings indicate that these features will not meet the waters of the state or US requirements and will not warrant additional protection or buffer.

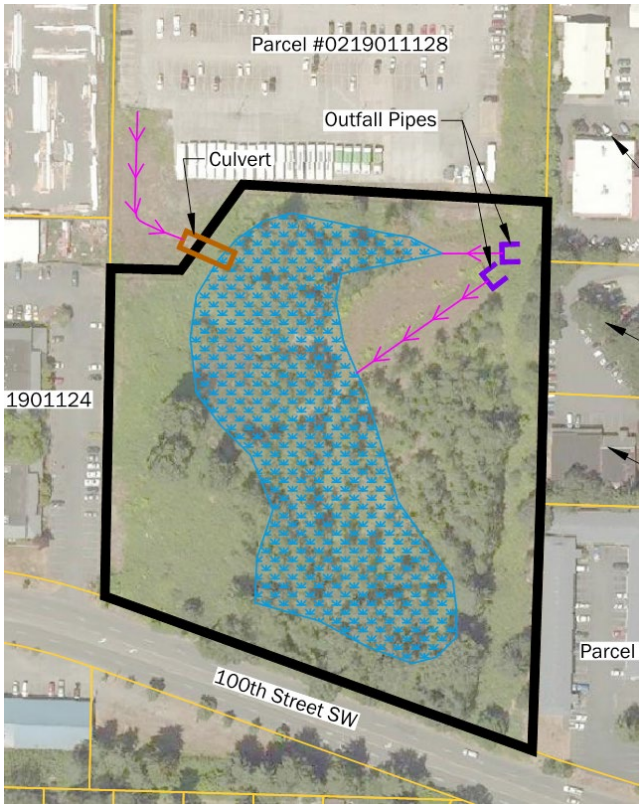


FIGURE 3-8 EXCERPT FROM THE JARPA APPLICATION SHOWING THE DEPRESSION ON THE SOUTH BASE AND EXISTING STORMWATER OUTFALLS.

4 FACILITIES ANALYSIS

4.1 OVERVIEW

EXISTING FACILITIES

Available information on the use, condition, and layout of each of the existing agency buildings was collected and reviewed by the planning team. This information was combined with anecdotal observations from the staff interviews and stakeholders. The existing conditions section compiles this information and provides comparison of the existing facilities against industry standards.

SPACE PROGRAM TABLE

A detailed space program table was created to track fleet and staff growth, space needs for all functions and maintenance operations, parking counts based on FTE and shift overlaps, and site space requirements for functions like vehicle parking and fuel and wash. The space program table is used to predict space, parking, or other needs. A copy of the detailed space program table can be found in Appendix A, and summary tables that are generated by the space program table are found throughout this section.

DESIGN CRITERIA

To develop the concepts found in the alternatives and preferred alternatives, a set of design criteria for each major program or site area was used. The design criteria are described in this section, and used throughout the document. The design criteria can be used to guide future development as well.

4.2 EXISTING CONDITIONS ANALYSIS

When determining the capacity of a transit maintenance and operations facility, it is critically important that four key elements be balanced – bus parking capacity, maintenance capacity, fuel and wash capacity, and employee parking. Typically, the element with the lowest capacity determines the capacity of the entire site.

For example, even if you can park 300 buses on a site, but only have fuel and wash capacity for 100 buses, the total capacity of the site is 100 buses.

Currently, the maintenance and fuel and wash capacities are not in balance with the bus parking capacity. There are over 300 buses in bus parking, but based on industry standards, the fueling capacity is only 225 buses (see discussion on Building 3 below) and the maintenance building needs 14 additional bays to accommodate the existing fleet size, refer to Figure 4-1 below.

The following pages describe the function and condition of each major building on the Lakewood Base.

BUILDING 1 - VEHICLE MAINTENANCE

Building 1 was originally constructed in 1986. A four bay addition to the east (Bays 1N, 2N, 11S, and 12S) was constructed in 2002. Building 1 has a total program area of 83,500 square feet including a 3,398 square foot parts storage mezzanine and a 667 square foot tire mezzanine.

Building 1 is a single story high-bay steel structure with steel columns, beams and roof structure, and a heavy industrial concrete slab. The exterior envelope includes walls of painted concrete block, areas of Exterior Insulation Finish System (EIFS), insulated storefront windows, and a built-up roof.

Conditioned air is provided by a constant volume ductwork system and conditioned with rooftop packaged heat pumps. Shop areas are heated by suspended gas fired furnaces. The 2002 addition utilizes a gas fired rooftop unit that also provides ventilation (standalone), and infrared heaters. Vehicle exhaust is removed via drop down hoses and rooftop utility fans.

Building 1 includes the following functions: bus repair bays, automotive repair bays, body repair and paint, component rebuild, parts storeroom, chassis wash, tire shop and storage, maintenance offices, mechanic amenities (including lunch room, wellness center, and restroom/locker/showers), and a chassis dynamometer.

Two paint booths are configured end-to-end to accommodate either two 40-foot buses or one 60-foot bus. These are the original paint booths and need to be replaced. Pierce Transit had an independent study done in 2017 on the existing paint booths which resulted in several options for consideration. Pierce Transit has decided not to upgrade the paint booths at this time.

The existing parts storeroom is woefully undersized for the current fleet. Consequently, parts are stored in various locations in the facility and around the site. Fluids (lubricants and coolant) used in Building 1 are stored in underground storage tanks just east of the existing lube/compressor room. There are four tanks, one for engine coolant, one for automatic transmission fluid, and two for engine oil. The pumps that draw from these tanks are located in the lube/compressor room. These tanks should be replaced with above ground storage tanks in a designated room within building 1 as part of the master plan.

Bus Repair Bays

Most repair bays are designed for back-in/pull-out, except for the bays extending to the east, which are in a drive-through configuration. The bus repair bays include 11 pit bays, 7 lift bays, and 5 flat bays. None of these bays are designed to accommodate articulated (60-foot) buses. Bays 2N and 11S are located end-to-end in a drive-through configuration and provide the only bay where articulated buses can be maintained, however out of necessity, articulated buses are also pulled into the drive-through pit bays (5N/8S, 4N/9S, and 3N/10S) and straddle the pits.

Existing repair bays are typically 18 feet wide, which is acceptable but does not meet the current industry standard of 20 feet wide. The tire bay, chassis wash bay, and chassis dynamometer bay are all designed to accommodate only up to 40-foot buses (i.e. not articulated buses).

The number and type of bays are not adequate to serve the current fleet's needs. Figure 4-2 shows the number of existing maintenance bays versus the number of bays needed to accommodate the existing fleet. Note that when only one specialty bay is needed, it should be sized to accommodate articulated buses. The analysis shows that the facility is short 14 articulated bus bays and four bays for NRV/Vanpool repair.

	EXISTING		INDUSTRY STANDARD		NEED	
	Standard	Articulated	Standard	Articulated	Standard	Articulated
Running Repair	15	—	14	1	1	(1)
Preventative Maintenance	7	—	6	1	1	(1)
Chassis Dynamometer/Brake Test	1	—	—	1	1	(1)
Campaign/Commissioning	—	—	—	1	—	(1)
Upholstery	—	—	—	1	—	(1)
Communication Technology	—	—	—	4	—	(4)
Chassis Wash	1	—	1	1	—	(1)
Tire Repair	1	—	1	1	—	(1)
Body Repair	4	—	6	1	(2)	(1)
Paint Prep	1	—	2	1	(1)	(1)
Paint Booth	2	—	2	1	—	(1)
TOTAL	**32**	**—**	**32**	**14**	**—**	**(14)**

	EXISTING	INDUSTRY STANDARD	NEED
NRV/Van Pool Repair	1	5	(4)
SHUTTLE Repair	3	3	-

FIGURE 4-1 EXISTING MAINTENANCE BAY ANALYSIS TABLE

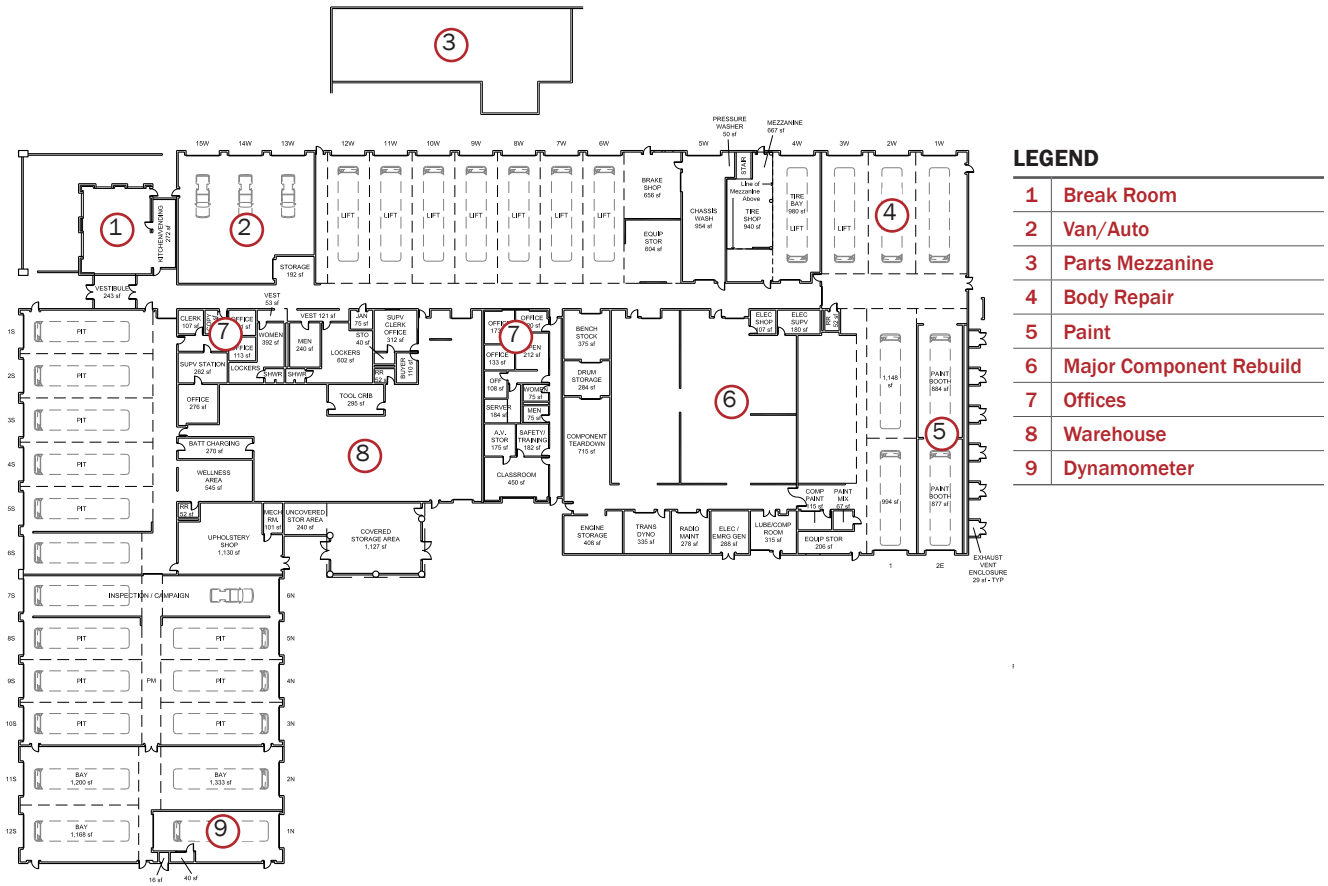


FIGURE 4-2 EXISTING MAINTENANCE BUILDING FLOOR PLAN

BUILDING 2 – BUS WASH AND FACILITIES MAINTENANCE

Building 2 was constructed in 1986 as part of the initial base development. The building contains one drive-through, 4-brush bus washer with water reclaim and the shops, offices, and storage associated with the Facilities Maintenance department. Building 1 has a building area of 6,440 square feet.

Building 2 is a single story, high-bay steel structure on a light industrial concrete slab. The exterior envelope includes walls of painted concrete block, areas of (EIFS), insulated storefront windows, and a built-up roof. Conditioned air is delivered via constant volume mechanical system with heating and cooling, and rooftop equipment.

Bus Wash Bay

The existing single bus wash bay is only 70-feet long. The standard for modern bus washers is a minimum length of 80-feet. With only one bus washer, when it is out-of-service, there are no back-up wash facilities. With a fleet of almost 300 buses, there should be a minimum of three bus washers.

Facilities Maintenance

The Facility Maintenance shops, storage, and offices are too small to adequately support the increased workload of the group since the facility was built. These functions should be relocated out of this congested area to improve vehicle access to the shop and storage and to improve safety by eliminating NRV traffic mixing with bus traffic.

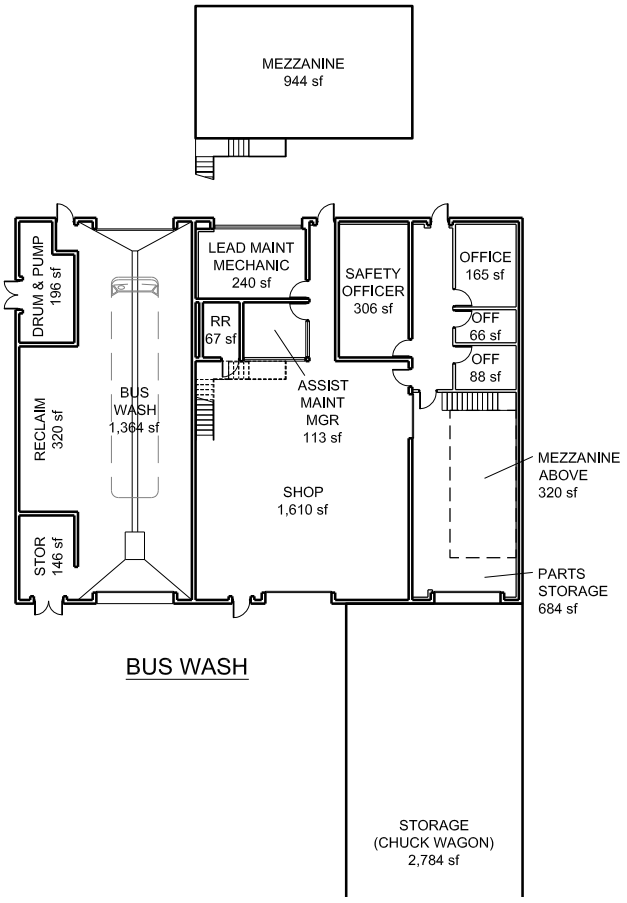


FIGURE 4-3 EXISTING BUS WASH & FACILITIES MAINTENANCE PLAN (BUILDING 2)

BUILDING 3 – FUEL AND MONEYCOUNTING

Building 3 was constructed in 1986 as part of the initial base development. There are two canopy-covered fuel positions and one outdoor fuel position. The building also contains enclosed conditioned space for fare retrieval/money counting, restrooms, and storage.

Building 3 is a 4,290 square foot single story high-bay steel structure with a light industrial concrete slab. The exterior envelope includes walls of painted concrete block, areas of Exterior Insulation Finish System (EIFS), insulated bulletproof windows, with a built-up roof. Conditioned air for the money-counting areas are delivered via constant volume mechanical system with heating and cooling, rooftop equipment.

The existing fuel positions are sized to accommodate up to 40-foot buses. Articulated buses extend out from under the canopy cover. The industry standard is to provide one fuel position for every 75 buses. This allows for an average dwell time of six to seven minutes for fueling, checking fluids, emptying the fare box vault, and cleaning the interior of the bus. The 75 buses can be serviced within an 8-hour shift. With three fuel positions, the facility should accommodate a total of only 225 buses. The only way to service the existing fleet of about 290 buses is to reduce the dwell time, which means that interior cleaning must be done in the bus parking area under less than ideal conditions.

CNG compressor equipment and storage is located along the north wall just east of Building 3. Ideally, this investment can be preserved by reusing the equipment in-place in the master plan. Diesel and gasoline are stored in underground storage tanks immediately east of Building 3. This is not an ideal location due to the fact that one or more fuel lanes would be impacted if remedial action or repair or replacement of the tanks was necessary.

The original cyclone vacuum equipment system that was used to assist in cleaning the interior of the bus is still in place, but is not operational. The bellows are located at the front door of the bus at fuel positions 1 and 2. This equipment should be removed, which will provide a clear area at the front door location. With this old vacuum equipment removed, the fare collection vaults could be moved to be located directly outside of the front door of the buses in the fuel lanes. This will expedite revenue retrieval and make the nightly servicing cycle more efficient.

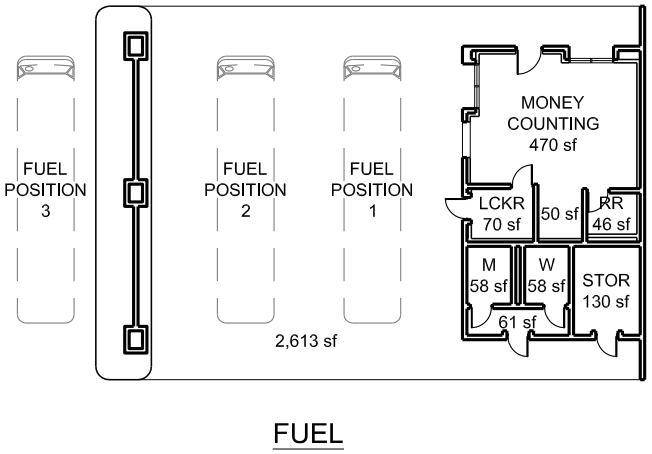


FIGURE 4-4 EXISTING FUEL BUILDING PLAN (BUILDING 3)

BUILDING 4 – ADMINISTRATIVE, EXECUTIVE & OPERATIONS

Building 4 was constructed in 1986 as part of the initial base development. It contains several administrative and operator areas, including Employee Services, Finance, Risk Management, Transit Development, Transportation Services, Community Development, Executive, Finance/Procurement & PMO, and Information Technology (IT). It also includes the executive suite, lobby and reception desk. Operator areas, including dispatch, lunchroom, locker room and amenity areas are also located here.

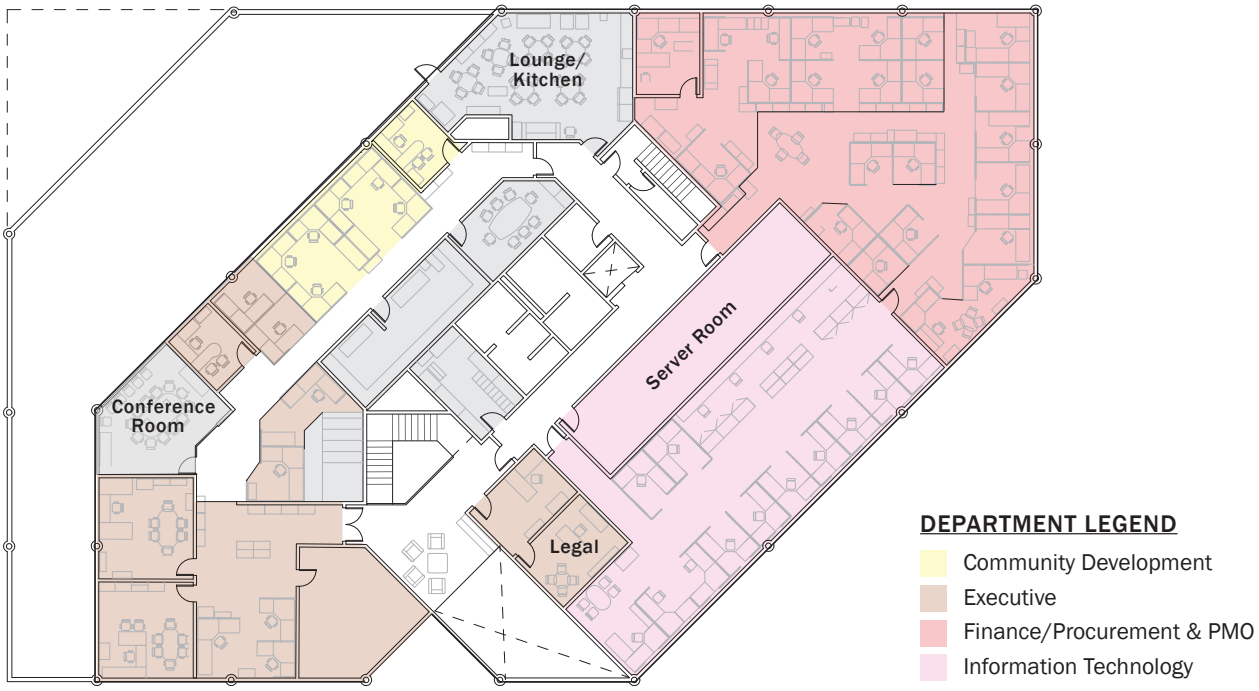
Building 4 is a 33,800 square foot two-story steel frame building with a steel frame mechanical penthouse, on a light industrial concrete slab. The exterior envelope consists of precast concrete panels, and EIFS wall panels, insulated aluminum framed storefront windows, and a built-up roof system with deck insulation and no ballast. Exterior balcony areas are concrete pavers.

Conditioned air is provided via a variable air volume (VAV) system served by a central 72-ton air handler with direct expansion cooling coils. The data center is cooled with two dedicated 30-ton rooftop packaged AHU. The building is fully sprinklered with a clean agent fire suppression system in the IT server room. A diesel emergency generator is also present.

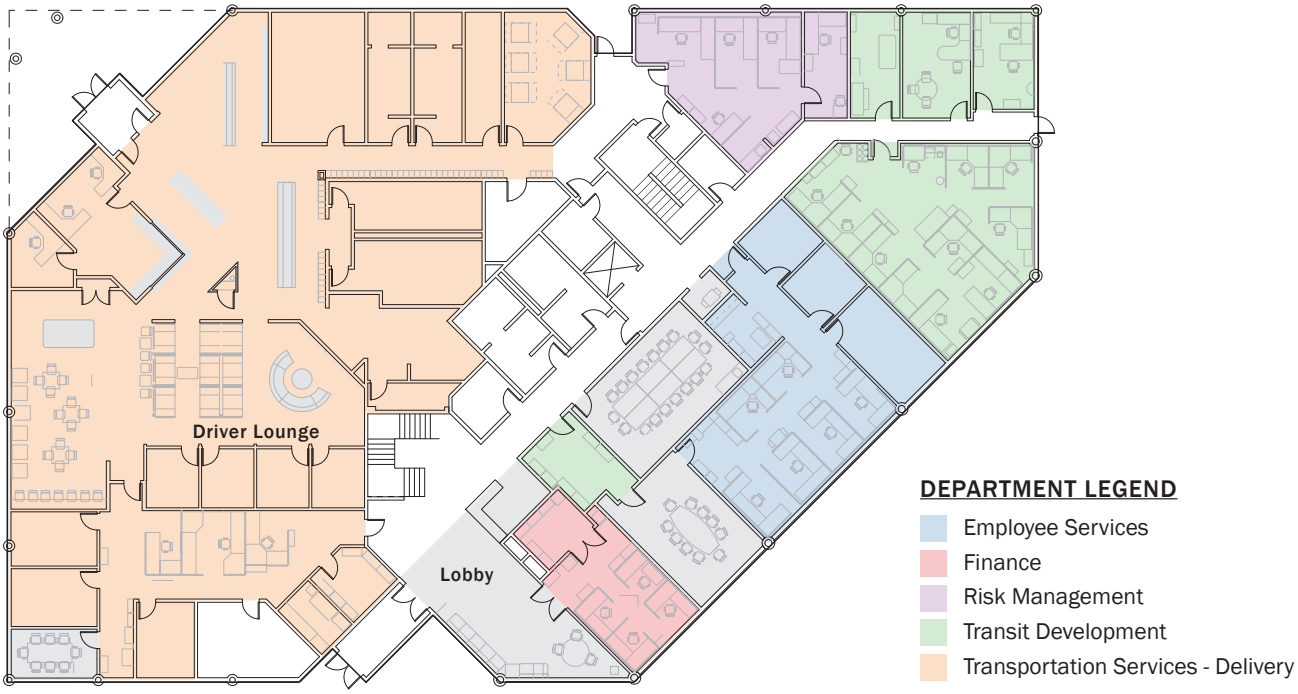
Building 4 is organized around a central core that contains stairs, utilities and restrooms. The perimeter office areas are divided into suites that are then further divided by individual offices. The unusual geometry of the building makes the workstation layout slightly less efficient. The operators lobby areas and dispatch function underwent a major renovation in 2015. Other areas vary in their condition and age.

There are five shared conference rooms distributed throughout the building. These vary in size from six to 18 person capacity. Conference rooms and collaborative space is at a premium in the building. In addition one of the conference rooms is regularly booked for extended periods for the “shakeup” (a process in which drivers select new routes) and for scheduled meetings.

Some suites are undersized for their departments and other are oversized. The suite configuration limits flexibility in this way, making it difficult for departments to grow and shrink. Offices vary greatly in size throughout the building. Some departments occupy spaces originally intended for other uses (for example the Budget office is in a former conference room).



BUILDING 4 - LEVEL 2 PLAN
1/16" = 1'-0"



BUILDING 4 - LEVEL 1 PLAN
1/16" = 1'-0"

FIGURE 4-5 EXISTING BUILDING 4 PLAN AND USES

BUILDING 5 – ADMINISTRATIVE & TRAINING

Building 5 was constructed in 2006 on the South Base. It contains several administrative and training functions, including Specialized Transportation, Transportation Services, Marketing, Lean & Workforce, Vanpool, and Public Safety. It also includes three large meeting rooms, a public lobby, and a lounge/lunchroom.

This 25,800 square foot two story steel structure has exterior walls of cast in place concrete, corrugated metal panels and insulated glass areas. The roofing is single ply membrane. Conditioned air is delivered via variable air volume ductwork, with one package HVAC unit located on the roof. The building includes an emergency generator.

Building 5 is organized around a central passageway with support spaces along the passageway and access points into the various suites that have been created for open office use. Similar to Building 4, this building lacks adequate conference and collaborative spaces. There are two conference rooms on the second floor that are heavily used.

Training rooms on the first floor provide space for large group meetings, board meetings that are open to the public, and special needs assessment. One conference room has been re-purposed into a computer lab.

There is no central reception for this building. Visitors utilize the lobby area on the NE corner, and must call up to the individual they wish to see. That person then comes down to the lobby to let them in. The lobby also contains an unused public service counter.

DEPARTMENT LEGEND

- Communications/Marketing
- Specialized Transportation
- Transportation Services - Delivery/Comm Center

BUILDING 5 - LEVEL 2 PLAN
1/16" = 1'-0"

DEPARTMENT LEGEND

- Information Technology
- Lean & Workforce
- Public Safety

BUILDING 5 - LEVEL 1 PLAN
1/16" = 1'-0"

FIGURE 4-6 EXISTING BUILDING 5 FLOOR PLAN AND USES

BUILDING 6 – FUTURE VANPOOL FACILITY

Building 6 was constructed in 1978, and was recently acquired by the agency for program expansion. Building 6 is located near the Main Base at 9620 40th Ave SE, and includes a one acre property that is primarily paved.

The building is a 10,400 square foot pre-manufactured steel truss building, with metal panel exterior cladding, concrete slab on grade, and high and low bay areas. Conditioned air is provided by individual rooftop mechanical units for each zone within the building.

Building 6 is not currently occupied. Proposed future uses include Vanpool offices and vehicle parking. A separate utilization study has been conducted concurrent to the master plan to explore the potential layout of the building interior and parking areas. A copy of the report is included in Appendix L.

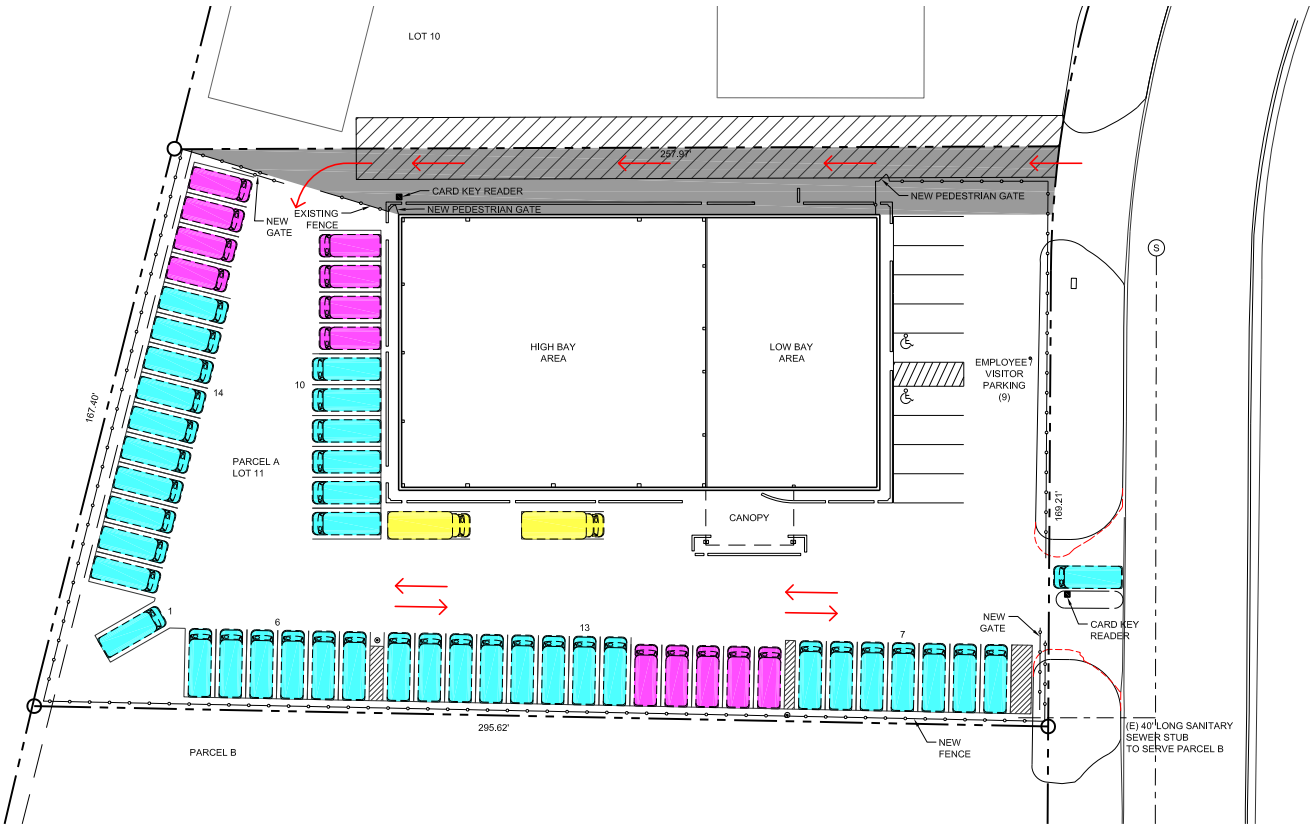


FIGURE 4-7 PROPOSED VANPOOL SITE PLAN DIAGRAM

EXISTING WEST BASE BUILDINGS

There are two existing warehouse buildings on the West Base, the Screaming Eagle building to the north and the former County Building to the south. The Screaming Eagle is used for storage and occasional flex space for the entire agency. The County Building has low rise and high-bay portions, with the high-bay portions occasionally used.

2016 FCI SCORES

In 2016 the agency hired an outside consultant to do a facility assessment. This effort identified all the major building systems and components, and estimated their remaining service life and approximate replacement value. From this analysis each building was given a Facility Condition Index (FCI) score as a relative indicator of overall condition for decision making purposes.

The FCI score is calculated by dividing the maintenance, repair, and replacement deficiencies of the facility / current replacement value of the facility. A higher number indicates deficiencies greater than replacement cost. A lower number indicates an item with a longer remaining useful life.

Reference standards provide a translation between overall FCI score and building condition as follows: good (under 0.05), fair (0.05 to 0.10), and poor (over 0.10). The following table summarizes the FCI scores assigned to each building on the base.

	YEAR CONSTRUCTED (AGE)	SQUARE FEET	FCI SCORE
Building 1	1986 (31 years)	82,500 sf	0.14 (poor)
Building 1 (addition)	2002 (15 years)	(incl above)	NR
Building 2	1986 (31 years)	6,440 sf	0.14 (poor)
Building 3	1986 (31 years)	4,290 sf	0.15 (poor)
Building 4	1986 (31 years)	33,800 sf	0.08 (fair)
Building 5	2006 (11 years)	25,800 sf	0.03 (good)
Building 6	1978 (39 years)	10,400 sf	NR
West Base Buildings	1977 (40 years) 1995 (22 years)	16,000 sf	NR

FIGURE 4-8 FCI SCORE SUMMARY TABLE

4.3 PROGRAM NEEDS

SPACE PROGRAM TABLE

A detailed space program table was created to track fleet and staff growth, space needs for all functions and maintenance operations, parking counts based on FTE and shift overlaps, and site space requirements for functions like vehicle parking and fuel and wash. Space standards are generated using industry standard program spaces along with workstation and office standards provided by Pierce Transit.

The space program table is used to predict space, parking, or other needs. A copy of the detailed space program table can be found in Appendix A, and summary tables that are generated by the space program table are found throughout this section.

STAFFING PROJECTIONS

ADMINISTRATIVE

The planning team reviewed existing building plans, and interviewed representatives of each department to determine program needs. A current program for each department was then developed and included in the space program table. Using growth percentages that align with the Destination 2040 plan, staffing counts and program needs were projected into the future based on either agency or fleet growth. Each department was then given an opportunity to review and modify the resulting staffing projections.

The following table summarizes the anticipated staff growth, based on the fleet and staffing projections and based on Pierce Transit aspirational growth of 3% annually.

	2017 (CURRENT) BASELINE	2022 (5 YEARS)	2027 (10 YEARS)	2032 (15 YEARS)	2037 (20 YEARS)	2040
Executive	17	17	17	17	18	18
Administration	50	61	61	67	74	74
Finance	27	28	28	28	31	31
Service Delivery & Support	329	323	318	327	345	366
Planning and Community Development	28	28	28	28	28	28
Total	451	457	452	467	496	517

FIGURE 4-9 ADMINISTRATIVE STAFF PROJECTIONS

MAINTENANCE

A similar process was followed to develop the maintenance staff projections. The table below shows the current and projected staffing for maintenance. Note that employees are separated into shifts, as a measure of how many staff are active in the maintenance area at any given time. Parking needs are calculated based on the maximum overlap count of any two shifts.

	2017 (CURRENT) BASELINE	2022 (5 YEARS)	2027 (10 YEARS)	2032 (15 YEARS)	2037 (20 YEARS)	2040
Day Shift Employees	79	76	83	83	83	87
Swing Shift Employees	33	29	32	30	32	35
Graveyard Shift Employees	27	25	25	26	27	29
Fuel & Wash	27	22	25	33	34	37
Total	**166**	**152**	**165**	**172**	**176**	**188**

FIGURE 4-10 MAINTENANCE STAFFING PROJECTIONS

DESIGN CRITERIA

The following are key criteria for administrative, maintenance, fueling and wash areas that are used to develop the detailed space program shown in Appendix A. These criteria also informed the planning alternatives developed for the master plan including the preferred alternative.

ADMINISTRATIVE DESIGN CRITERIA

- Over the long term, workstation size should be standardized as much as possible. For the purposes of the space program table, variations in workstation sizes by department were maintained. A copy of the workstation, office and conference room type table is included in Appendix A.
- Closed offices sizes vary based on department and title. Office types are included in Appendix A. Executive team offices remain at their current sizes and ratios.
- Conference room spaces need to be expanded. Additional generic conference spaces were added to the space program table, and all existing conference rooms were maintained (or will be recreated in the new plan).
- Shared physical storage will be maintained and expanded (archiving is currently through warehouse, but there is a desire for in-building shared storage.
- 35% circulation factor is used for the purpose of calculating building efficiency and accounting for stairs, restrooms, mechanical and electrical rooms, and other shared support spaces and circulation.
- Suites should be combined and non-standard office areas should be eliminated for long-term flexibility.

MAINTENANCE DESIGN CRITERIA

Vehicle Bay Criteria

- Vehicle maintenance bays are to be designed for back-in / pull-out / or pull-through.
- Vehicle maintenance bays are to be 20 feet wide. When a bay is adjacent to a wall, an additional 5'-0" should be provided along the wall for proper clearance.
- Vehicle maintenance bays are to be 15 feet longer than the vehicle being served. This provides 5 feet in front of the bus and 10 feet behind the bus. A standard bus bay should be 55'-0" long and a bay for articulated buses should be 75'-0" long.
- All single specialty bus bays should be sized to accommodate articulated buses.
- Each repair bay will have a 14'-0" x 14'-0" overhead door to the exterior, similar to the size provided on the existing facility. This is currently the industry standard. Note that the maximum height currently allowed by law to operate on the road in the United States is 13'-6". An overhead door that is 14'-0" tall will accommodate this height vehicle, including double deck buses that are legal to operate on roadways in the United States. At the recent APTA Expo, several foreign made double deck buses were on exhibit that were between 14 and 15 feet tall. If the law is changed to allow these buses to operate on roadways in this country, the height of the overhead doors should be raised to 16 feet high. Pierce Transit needs to determine if all new repair bays will be designed with 16 foot high doors to accommodate the taller vehicles if the law changes.

Maintenance Ratios

FUNCTION	RATIO
RUNNING REPAIR BAY	One bay per 20 buses.
PREVENTIVE MAINTENANCE	One bay for every 50 buses.
CHASSIS WASH	One chassis wash bay for every 150 buses. The chassis wash bays should be located adjacent to the bus washer and should be in a drive-through configuration.
TIRE REPAIR	One tire repair bay for every 150 buses.
UPHOLSTERY REPAIR	One upholstery repair bay (sized to accommodate an articulated bus) adjacent to the upholstery shop.
TIRE STORAGE	Provide storage for 1.5 tires per bus.
SHIPPING AND RECEIVING, TOOL CRIB, AND PARTS OFFICES.	Provide 50 square feet per bus in the parts room in addition to dedicated space for shipping and receiving, tool crib, and parts offices.
BODY REPAIR	One body repair bay for every 50 buses.
PAINT BOOTH	One paint booth for every 150 buses.
PAINT PREP	One paint prep bay for every paint booth.
CAMPAIGN / COMMISSIONING	One campaign / commissioning bay (sized to accommodate an articulated bus).
CHASSIS DYNAMOMETER BAY.	One chassis dynamometer bay (sized to accommodate an articulated bus).
DETAIL CLEAN BAY	Provide canopy covered detail clean bays based on 4 hours per bus with a 21-day interval.

Support Spaces

- Provide dedicated space for portable equipment storage.
- Provide a common work area for shop equipment such as buffer/grinder, drill press, hydraulic press, brake lathe, and an area for bench work.
- Provide adequate mechanic amenities such as lunch room, wellness center, restroom/locker/showers for men and women.

FUELING DESIGN CRITERIA

- Provide one fuel position for every 75 buses.
- Each fuel position is to include a diesel dispenser, a CNG dispenser, fluid reels (engine oil, automatic transmission fluid, and engine coolant), and a DEF reel.
- All fuels and fluids are to be controlled with a fuel management system.
- Diesel and gasoline will be stored in underground storage tanks.
- All lubricants and DEF will be stored in above ground storage tanks in the lube / compressor room.
- A money counting / fare retrieval facility will be provided in the fuel building.
- Farebox vaults will be emptied at the fuel island by service personnel.
- Provide amenities for service personnel including restrooms (men and women) and a breakroom in the fuel building.
- Fuel positions will be canopy covered
- The existing CNG compressor equipment should be reused if possible.
- Each fuel position should be 20’-0” wide by 75’-0” long to accommodate articulated buses.

WASH DESIGN CRITERIA

The following are key criteria for the wash facility used to develop the detailed space program shown in Appendix A.

- Provide at least one bus washer for every 150 buses. The proposed space program provides for three bus washers.
- Locate chassis wash bays adjacent to the bus wash bays.
- Provide water reclamation system to support the bus washers.
- Bus washers should be enclosed and heated. The overhead door at each end of the wash lane should be fast-acting and water resistant.
- Each bus wash lane should be 20’-0” wide by 80’-0” long to accommodate state-of-the-art drive through bus wash equipment.

APPLICABLE BUILDING CODES AND REGULATIONS

All new building and site development must comply with the applicable provisions of the International Building Code (IBC) as modified by amendments adopted by the City of Lakewood. The current set of adopted codes is 2012, however these will change and future projects will be evaluated for building code compliance on a permit-by-permit basis as they are proposed.

The following codes and design criteria apply within this jurisdiction:

2012 International Building Code	Ground Snow load 25lb/sf, Roof Snow load 25 lbs/sf
2012 International Fire Code	Seismic Design Category D1
2012 Uniform Plumbing Code	Weathering: Moderate
2012 International Mechanical Code	Exposure B
2012 International Fuel Gas Code	Frost 12 inches
2012 International Existing Buildings Code	

PHYSICAL SPACE NEEDS

Combining the staffing and fleet projections with the design criteria results in a calculation of the physical space needs of the agency through 2040. A detailed list of each program space can be found in the space program table in Appendix A. The following tables shows the additional building space needed to accommodate the required program.

	EXISTING	2017 (CURRENT) BASELINE	2022 (5 YEARS)	2027 (10 YEARS)	2032 (15 YEARS)	2037 (20 YEARS)	2040
Combined Fleet							
Administrative & transportation services	59,600	60,975	62,820	63,105	64,325	68,770	69,270
Maintenance	82,500	143,810	138,735	135,890	139,545	134,085	138,885
Fuel & Wash (+ Facilities Maint)	15,785	37,835	37,835	35,773	37,833	34,010	35,660
TOTAL	**157,885**	**242,620**	**239,390**	**234,768**	**241,703**	**236,865**	**243,815**

FIGURE 4-11 BUILDING AREA NEEDS

DEPARTMENTAL ADJACENCIES

The following primary adjacencies between major functions were identified during the staff interviews and should be considered when planning new administrative spaces.

COMMUNICATIONS CENTER / OPERATORS AREA

Currently the Communications Center is located in Building 5, level 2 and the Operators Area is in building 4 level 1. Ideally these two groups would be co-located for ease of communication and staff familiarity as they communicate frequently with each other in the field. Better communication between comm center and supervisors would also be a secondary benefit.

BUDGET / FINANCE / PROCUREMENT / PMO

Finance / Procurement and PMO are collocated now on Building 4, level 2, Budget is located in a re-purposed conference room in Building 4, level 1. Ideally all these related departments are co-located. Budget has additional privacy consideration that must be taken into account with such an adjacency.

PMO / TRANSIT DEVELOPMENT

Currently PMO is in Building 4, level 2, Transit Development is in Building 4, level 1. Ideally collocated due to overlap of purchasing/PM and capital project needs. Often communicating on purchase orders, invoices, etc.

IT / PMO

These two departments are currently adjacent to each other on building 4 level 2. This adjacency is useful because of project and purchase order overlap, required input from IT department on a regular basis.

IT/COMMUNICATIONS

Currently IT is in Building 4, level 2, and Communications is in both Building 1 and West Base. Ideally these two groups would be adjacent due to the close relationship between their two functions and systems.

POTENTIAL OFFSITE FUNCTIONS

Several groups discussed the possibility of moving off-site over the long term. This would have two potential advantages: any department or program moving off-site reduces the space needs on the Main and South Bases, and those programs might be better located to serve their specific customers or constituents. The following is a brief summary of the groups that indicated that they could move off-site in the long term.

CUSTOMER SERVICE

Currently in the TDS, this function's call center could be located anywhere, and the bus shop and lost and found functions may be better located in Downtown Tacoma for ease of wayfinding and access.

COMMUNITY DEVELOPMENT

Currently in Building 4, level 2, this group has frequent contact with city officials and could benefit from a central downtown Tacoma location.

MARKETING PRODUCTION

Currently in Building 5, Level, this department has no direct connection to the revenue vehicles other than fitting mockups of graphics. Printing and production (now done in Building 5) could be outsourced or contract work in order to reclaim this space for other uses.

ADA ELIGIBILITY ASSESSMENT FUNCTION

Currently in large meeting rooms, no permanent location exists for this regular weekly or bi-weekly assessment process for individuals wishing to apply for assistance. This function could be conducted elsewhere, perhaps in a more central and accessible location to the coverage area. Ideally this would be a dedicated space, with waiting area, restrooms, appeals room and better access. A better space may also allow a full time vendor.

SHUTTLE CALL CENTER / DISPATCH

The SHUTTLE call center could be located off-site, or outsourced long term. Ideally this is collocated with eligibility assessment group, currently requires frequent contact with SHUTTLE dispatch. However, a technology solution may suffice.

AUTOMOTIVE MAINTENANCE FACILITY

Currently this function takes up valuable space in Building 1, could be relocated to an adjacent property, or could be contracted out. First Transit already maintains some vehicles on a vendor basis.

5 ALTERNATIVES ANALYSIS

5.1 OVERVIEW

The planning team worked with Pierce Transit throughout the course of a two-day workshop to discuss site alternatives. These alternatives represented a wide range of possible approaches to long-term growth ranging from renovation-only schemes to complete replacement.

RANGE OF ALTERNATIVES

Eight alternatives were developed and evaluated by the Pierce Transit stakeholder group and the executive team. Three of the eight alternatives were then selected for further development, and are described below. One of the alternatives was ultimately chosen by the agency as the preferred option. That alternative is described in concept below and in detail in the Preferred Alternative section.

Each alternative was planned using the design criteria established during the discovery phase. Conceptual vehicle capacity, circulation and parking were discussed. The following section describes the key concepts, advantages and disadvantages of each alternative.

All alternatives are included in Appendices I and J.

5.2 ALTERNATIVE 1 – INCREMENTAL EXPANSION/ RENOVATION (PREFERRED)

Alternative 1 was selected as the preferred option by the stakeholder group and executive team. The scheme places a high priority on retaining existing buildings and infrastructure to minimize disruption to ongoing operations and retain existing capital investment.

KEY CONCEPTS – ALTERNATIVE 1

- Provide revenue vehicle expansion by expanding the existing revenue vehicle parking lot into the Main Base site area north of Building 4.
- Replace the fuel and wash facilities to increase throughput, safety and capacity.
- Expand the South Base parking and consolidate employee parking on that site.
- Develop the West Base to provide maintenance expansion space to address warehouse, safety and bay capacity.
- Renovate and expand existing Building 1, including expanded warehouse and articulated bus bays.
- Retain Building 4 and expand its footprint to address all administrative needs, consolidate communications and operations departments.

ADVANTAGES

- Cost efficient: invests in existing buildings and facilities where possible vs building new.
- Expands capacity, improves safety.
- Long-term separation and clear zoning of revenue/employee/NRV vehicle paring and flows.
- Provides additional revenue lot safety (14’-0” bus lanes, flow separation).
- Can be phased in different ways to respond to agency preferences.
- Accommodates Pierce Transit-only fleet growth to 2040, combined Pierce Transit / Sound Transit fleet growth to 2027. Minimizes deadheading if second base is also built.

DISADVANTAGES

- Retaining existing buildings limits quality of facility (have to make compromises).
- Incremental renovation and expansion has greater impact on daily operation, and requires surge space.
- Retaining Building 4 requires pedestrian crossing for admin staff from south base parking.
- Retaining Building 4 limits size of revenue vehicle lot expansion.
- Will not accommodate the number of projected fleet vehicles to 2040, even with expansion.
- Requires a second base for Pierce Transit or Sound Transit within that timeline if Pierce Transit growth follows the aspirational plan..

VEHICLE CAPACITY

- Alternative 1 provides parking and maintenance capacity for approximately 360 vehicles using 14’ wide spaces.

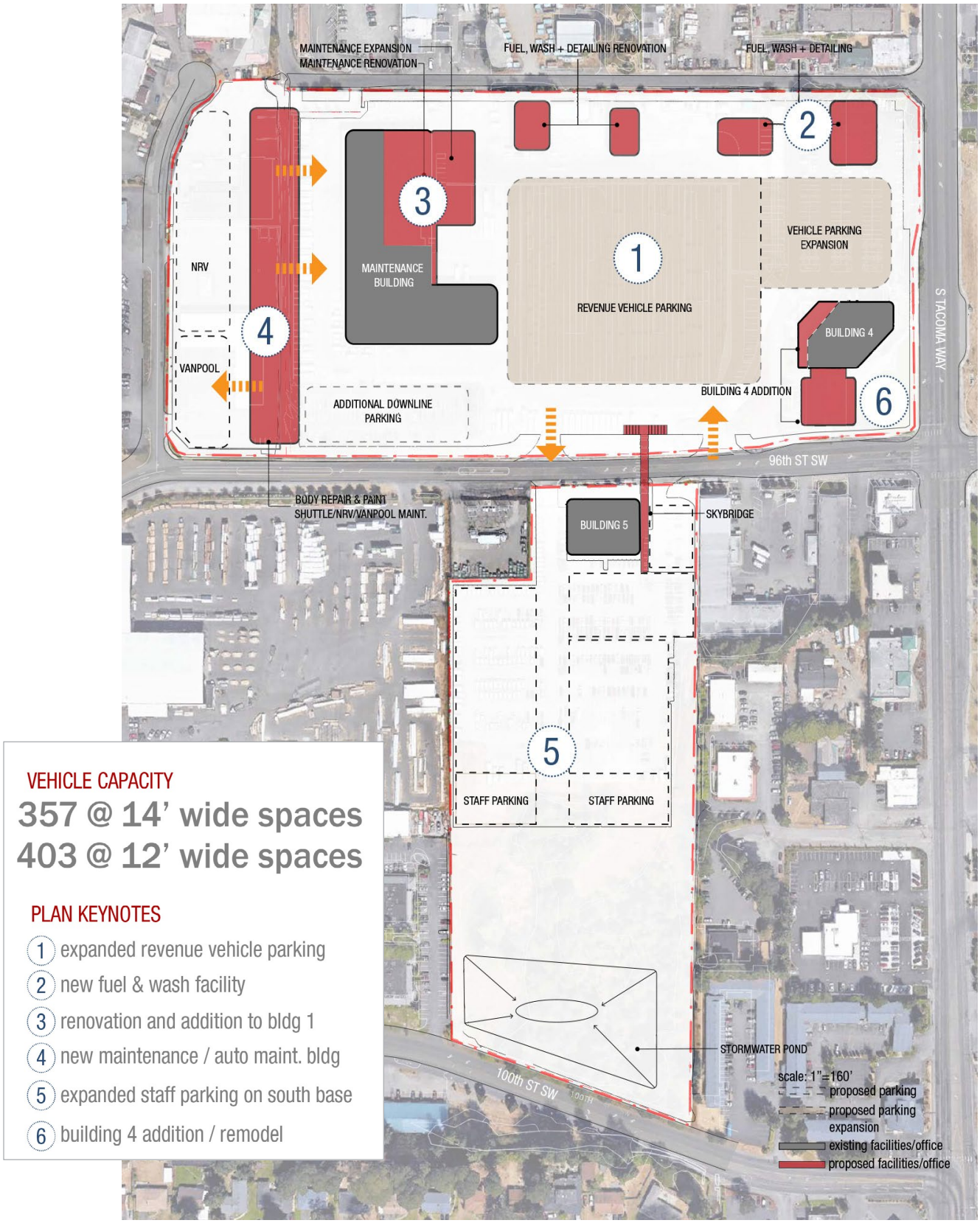


FIGURE 5-1 OPTION 1

5.3 ALTERNATIVE 2 – RENOVATION/REPLACEMENT

Alternative 2 was not selected as the preferred alternative and was not developed beyond the Alternative Analysis phase. The scheme places a high priority on retaining and reuse of existing facilities, except for Building 4 – which is removed to allow revenue vehicle lot expansion to accommodate the full Pierce Transit and Sound Transit combined fleet to 2040.

KEY CONCEPTS – ALTERNATIVE 2

- Provide revenue vehicle expansion by expanding the existing revenue vehicle parking lot into the Main Base site area north of Building 4.
- Replace the fuel and wash facilities to increase throughput, safety and capacity.
- Expand the South Base parking and consolidate employee parking on that site.
- Develop the West Base to provide maintenance expansion space to address warehouse, safety and bay capacity.
- Renovate and expand existing Building 1, including expanded warehouse and articulated bus bays.
- Add a new administrative and operations building to the South Base to accommodate administrative growth, operations and all non-maintenance office and facility needs.

ADVANTAGES

- Maximizes revenue vehicle capacity at the base while retaining and renovating Building 1.
- Accommodates the entire projected Pierce Transit and Sound Transit combined fleet until 2040.
- Provides for a new state-of-the-art operations and administration building, including more robust communications, IT, and systems infrastructure than those available through a renovation.
- New administrative building allows phased occupancy, minimal disruption to staff.
- Reduced pedestrian traffic across 96th St SW.
- Long term separation and clear zoning of revenue / employee / NRV vehicle paring and flows.
- Provides additional revenue lot safety (14’ bus lanes, separation).

DISADVANTAGES

- Greater cost due to new building site and construction.
- Facility size and number of vehicles will be larger than many other comparable facilities.
- Deadheading potential is greater due to single point of distribution for entire vehicle fleet (single base).

VEHICLE CAPACITY

- Alternative 2 provides parking and maintenance capacity for approximately 460 vehicles using 14’ wide spaces.

VEHICLE CAPACITY

460 @ 14' wide spaces

PLAN KEYNOTES

1. expanded revenue vehicle parking
2. new fuel & wash facility
3. renovation and addition to bldg 1
4. new maintenance / auto maint. bldg
5. expanded staff parking on south base
6. building 4 replacement

FIGURE 5-3 OPTION 2

5.4 ALTERNATIVE 3 – REPLACEMENT

Alternative 3 was not selected as the preferred alternative and was not developed beyond the Alternative Analysis phase.

This option treats the entire Main Base site as a blank slate, ultimately replacing buildings 1,2,3 and 4 (as these buildings are nearing or already beyond their useful life) with new expanded facilities.

KEY CONCEPTS – ALTERNATIVE 3

- This option provides new state-of-the art maintenance facilities, accommodates the combined Pierce Transit / Sound Transit vehicle fleet, and consolidates administrative and operations functions to the South Base.
- Requires significant redevelopment and reconfiguration of existing systems and site development.
- Retains Building 5 and adds a second administrative building to the south to contain the entire administrative and operations functions in a single complex.
- Consolidates and expands revenue vehicle parking on the main base to accommodate the entire projected combined fleet of PT/ST.
- Expands to West Base with a new maintenance facility, and replaces the existing fueling and wash buildings with new facilities.
- Adds a maintenance building to the south edge of the main Base that can be constructed during ongoing operations.
- Expands the South Base parking and consolidate employee parking on that site.

ADVANTAGES

- Avoids complex renovation and phasing involved in other plans that retain some or all existing buildings.
- Provides a state-of-the-art facility.
- Accommodates the entire Pierce Transit and Sound Transit fleet in one location to 2040.
- Improved revenue vehicle access, parking, and efficiency.
- Separate non-revenue vehicles and administrative areas from revenue vehicles and maintenance.

DISADVANTAGES

- Highest total cost due to new building site and construction
- Requires demolition of Building 4
- Larger South Base footprint required for new building and staff parking
- Facility size will be larger than many other comparable facilities
- Deadheading potential is greater due to single point of distribution for entire vehicle fleet (single base)

VEHICLE CAPACITY

- Alternative 3 provides parking and maintenance capacity for approximately 460 vehicles using 14’ wide spaces

VEHICLE CAPACITY

460 @ 14' wide spaces

PLAN KEYNOTES

1. expanded revenue vehicle parking
2. new fuel & wash facility
3. new maintenance building
4. new maintenance / auto maint. bldg
5. expanded staff parking on south base
6. building 4 replacement

FIGURE 5-4 OPTION 3

6 PREFERRED ALTERNATIVE

6.1 OVERVIEW

Alternative 1 was selected as the preferred option by the stakeholder group and the executive team. This scheme places a high priority on retaining existing buildings and infrastructure, minimizing disruption to ongoing operations through incremental phasing.

SUB PROJECTS

The selected option was developed further by the project team, and the plan was broken into a series of sub-projects which are described below. Each of the sub-projects can be undertaken as separate construction projects or grouped together depending on agency preference. For the purposes of the Master Plan Update, the sub projects have been grouped by phase in a logical sequence to minimize disruption to the operating base and maximize vehicle capacity in the near term. These projects also address the needs identified during the discovery phase of the planning process (and described in the Facilities Analysis and Site Analysis sections).

IMPLEMENTATION SCHEDULE / PHASING APPROACH

There are a total of 14 sub-projects, each of which is described below. These projects are grouped into four major phases of renovation. An Implementation Schedule developed by the team shows one way in which these projects could be completed. This schedule assumes an aggressive timetable, and represents the fastest route to completing all of the sub-projects identified.

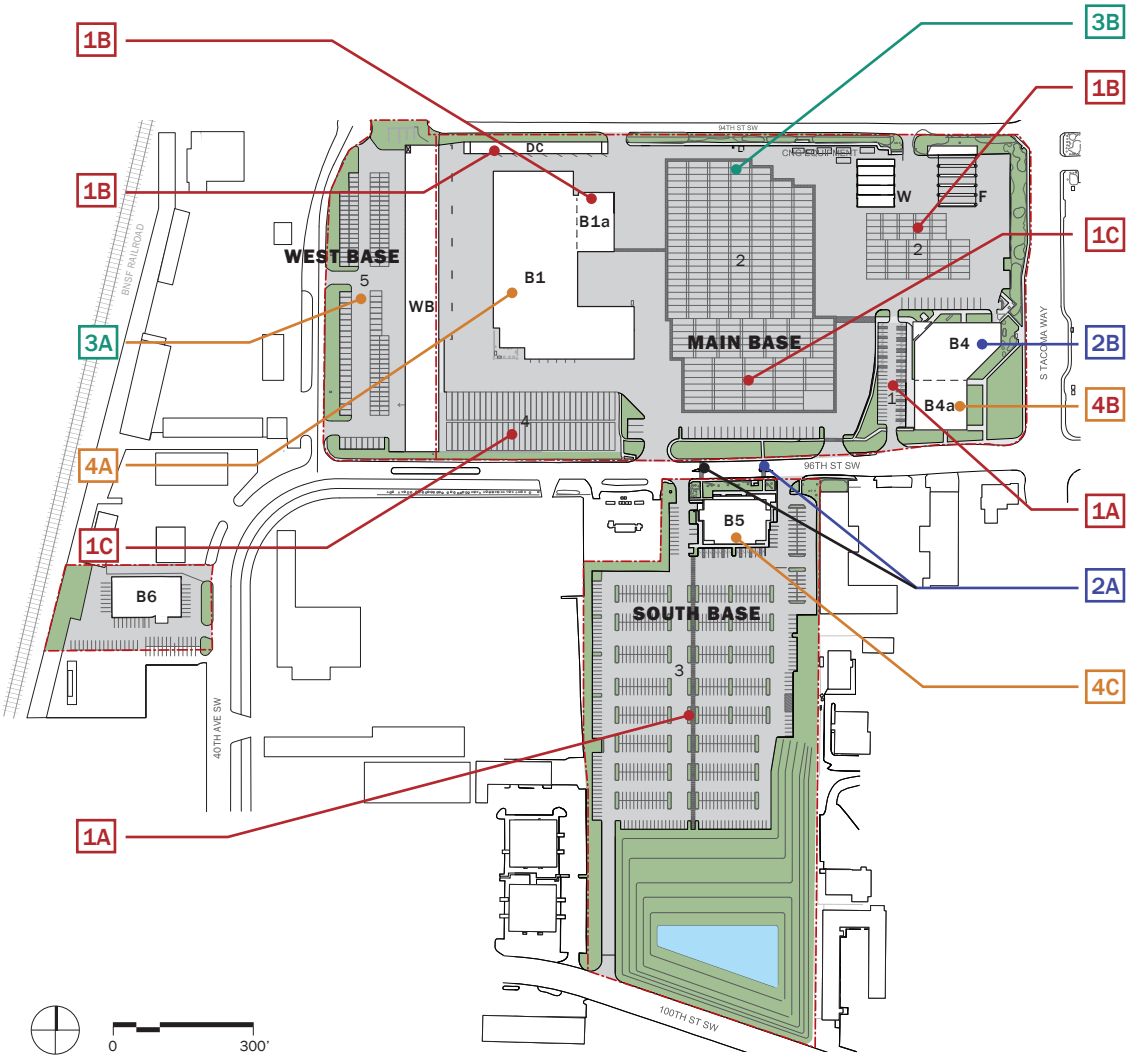
COST ESTIMATE

A conceptual cost estimate for each sub-project has also been developed, and a detailed breakdown of the assumed construction costs, project, and soft costs are included in Appendix D. Each estimate is presented in 2017 dollars, and then an escalation factor is applied based on the implementation schedule to calculate the total project cost for all phases. General-Contractor/Construction-Manager (GCCM) is the assumed project delivery method for the larger phases (phase 1 & 3) and Design-Bid-Build is assumed for the smaller phases that involve singular renovation projects.

CAPACITY ANALYSIS

All of the projects are deemed necessary by the Agency to support the long term goals identified, and each supports the whole concept in terms of updating the base to meet contemporary standards for similar facilities. However, not all sub-projects have a direct impact on base capacity.

A summary of the impacts of each sub-project on parking, fueling, or maintenance capacity is also included in this section.



PHASES

1A	Building 4 Parking Improvements Expand South Base Parking
1B	Demolish Public CNG and Build New Detail Clean Facility Articulated Bus Bay Addition to Building 1 Expand Bus Parking and New Fuel & Wash and Electric Bus Charging Stations
1C	Regrade and Pave VSR, Bad Order, Surplus Parking Bus Lot Reorientation Restriping and Entry Improvements
2A	Pedestrian Crossing Improvements
2B	Building 4 Work Place Improvements
3A	West Base Facility
3B	Demolish Existing Building 2
4A	Building 1 Renovation
4B	Building 4 Addition and Renovation
4C	Building 5 Renovation

BUILDING

B1	Building 1 - Vehicle Maintenance
B1a	Building 1 Addition - Artic Bays
B4	Building 4 - Admin / Operations
B4a	Building 4 Addition - Admin/Ops/Com
B5	Building 5 - Admin / Training
B6	Building 6 - (Unoccupied)
WB	West Base Maintenance Facility
DC	Detail Clean Facility
W	4-Bay Wash Building w/Chassis Wash
F	5-Bay Fuel Building

PARKING

1	Admin/Visitor Parking (67 spaces)
2	Revenue Vehicle Parking (14' spaces)
3	Employee Parking (647 spaces)
4	VSR/Surplus/Downline
5	Vanpool/Facilities/NRV/Shuttle Parking (187 spaces)

FIGURE 6-1 THE PREFERRED ALTERNATIVE WITH ALL PHASES AND IMPROVEMENTS SHOWN COMPLETED

6.2 PROPOSED IMPROVEMENTS

Through the course of the study it became clear that the Agency has been operating beyond the existing base capacity for quite some time. Employees are resilient and agile at solving problems within the constraints of the current facility, but in order to address the long-term needs of the Agency, the focus of the proposed improvements must be on increasing base capacity, measured using contemporary transit planning standards.

To do this, a series of sub-project improvements are proposed to increase revenue vehicle parking capacity, maintenance capacity or fuel & wash throughput capacity. Many of these projects also address safety concerns. As the combined fleet and Agency continue to grow, upgrading and replacing aging facilities is an important part of re-organizing the base for continued and new uses and vehicle types. The following section outlines the improvements in each base area by sub-project.

Table 6-1: PROPOSED PROJECTS & PHASES BY LOCATION

phase	1A	1B	1C	2	3	4
MAIN BASE IMPROVEMENTS						
Building 4 Parking Expansion	•					
Expand Bus Parking / Construct New Fuel and Wash + Elec Bus Charging Stations		•				
New Detail Clean Facility		•				
VSR/Bad Order/Surplus Parking Expansion			•			
MAINTENANCE BUILDING IMPROVEMENTS						
Building 1 Addition		•				
Building 1 Renovation						•
ADMINISTRATIVE BUILDING IMPROVEMENTS						
Building 4 Renovation				•		
Building 4 Addition / Comprehensive Renovation						•
SOUTH BASE IMPROVEMENTS						
South Base Parking Expansion	•					
Stormwater Pond And Connection To 100th Street SW	•					
Pedestrian Crossing Improvements				•		
BUILDING 5 IMPROVEMENTS						
Building 5 renovation						•
WEST BASE IMPROVEMENTS						
West Base Maintenance Facility					•	

REVENUE VEHICLE PARKING IMPROVEMENTS

The Main Base contains all revenue vehicle parking and the existing maintenance, fuel and wash facilities. Building 4, which remains on the Main Base in the preferred alternative is also located here with the operators lobby and other primary administrative functions.

BUILDING 4 PARKING EXPANSION

This early phase project includes expansion of the existing parking lot south and east of Building 4 to accommodate visitor, handicapped, and relief vehicle parking needs that must remain adjacent to the building to serve the program that remains. These parking spaces are displaced by the expansion of the revenue vehicle lot into the admin parking lot.

Site development in this area will likely require structured stormwater detention and water quality measures that could be tied in with the revenue parking lot improvements to the north. In addition any new paved areas will need to comply with the City of Lakewood landscaping and screening requirements. This lot will be configured to avoid conflict with the future addition to Building 4.

- The concept design shows a total of 67 total spaces, including 26 fully compliant ADA spaces to match those currently in the admin and visitor parking lots.
- The number of accessible spaces in the current lot exceeds the code minimum by a sizeable margin. This count should be explored further during the design phase of this parking area.
- Apart from the accessible spaces, none of these parking spaces are required by code as the South Base expansion will meet the mandated parking needs of Building 4 (remote parking within 750 feet).

EXPAND BUS PARKING / CONSTRUCT NEW FUEL AND WASH / ELECTRIC BUS CHARGING STATIONS

A revenue vehicle parking lot expansion is combined with the new fuel and wash facility north of Building 4. Electric vehicle charging stations and related infrastructure is also located in this area.

Expanded Bus Parking

This is the only significant area available for revenue vehicle parking expansion on the Main Base, and represents the primary way to expand vehicle parking capacity within the preferred alternative.

All new bus parking and circulation paving will be concrete, and the existing lot will be regraded to align with the adjacent paving of the existing revenue vehicle lot. Circulation in this expanded bus parking area is shown on the attached vehicle circulation diagrams, and striping will meet the new 14’ wide spacing and will be oriented E-W. Re-paving this area will require new structured stormwater detention and water quality infrastructure. Landscaping along the South Tacoma Way will be retained for visual screening.

Fuel & Wash

The new fuel & wash facility is critical to increasing the fuel and wash capacity of the Main Base. Existing fuel and wash facilities are sub-standard and have become a chokepoint in the throughput of the base. New fueling and wash facilities will allow for greater efficiency, safety and fleet capacity.

The new fuel and wash facility is built along the north side of the site north of Building 4 as shown. The new fuel facility includes five fueling positions, all sized to accommodate articulated buses. The existing CNG compressor equipment along the north edge of the Main Base is reused to feed the new fuel facility.

New underground fuel storage tanks (constructed immediately south of the new fuel facility) and a new emergency generator is included in project costs for the new fuel and wash. The new fuel facility will meet the design criteria outlined in the Facilities Analysis section.

Once the new fuel and wash facility is completed, the existing Buildings 2 (Wash/Facilities Maintenance) and 3 (Fuel/Money Counting) are demolished, and existing underground fuel tanks located in this area may be removed or decommissioned. Additional bus or NRV parking can be then constructed in the area vacated by the fuel building.

At the request of the agency, the planning team also identified a series of immediate safety improvements that could be accomplished in the short term to improve safety at the existing fuel & wash without requiring significant infrastructure or building improvements. The following improvements were recommended:

1. Install warning horn and strobe at the exit of the bus wash bay in Building 2. The horn and strobe should be activated automatically when a bus enters the washer.
2. Paint a safety zone on the pavement at the exit to fuel (Building 3) and wash (Building 2). This would be marked as a “No Pedestrian” zone.
3. Remove the vacuum bellows and other remaining interior cleaning system components on each fuel lane.
4. Move the vault pull function in each fuel lane to the area vacated by the vacuum bellows.
5. Consider installing a hose gantry in each fuel lane for safer hose management.
6. Identify a safer location for Detail Clean and relocate this function so that it is not in the bus circulation lane east of Building 1.
7. Identify an acceptable method/location for pre-washing wheels nightly, prior to the bus wash.

Note: These safety improvement projects are not all included in the Master Plan cost estimate or implementation plan and are described above for reference only.

Consideration was given to renovating the existing fuel and wash facilities but this approach was discarded for the following reasons:

- The existing bus wash lane is not long enough to accommodate state-of-the-art bus wash equipment. Expansion of the existing wash bay is not feasible while continuing operations.
- A second bus washer is required to accommodate the projected fleet size. Expansion for the second washer would need to be on the south side of the existing wash, which would reduce the area for bus parking.
- The existing fuel lanes would need to be expanded to the east (to accommodate articulated buses) and to the south (to accommodate additional fuel positions) to accommodate the projected fleet. This would impact the existing underground fuel storage tanks and reduce the area for bus parking.
- Most importantly, major construction would be required in an area that is critically important to continuing bus service to the public. Construction in this area, while continuing daily fuel and wash activities, should be avoided if possible. It would not be cost effective and maintaining safe operations would be difficult at best.

Electric Vehicle Charging Stations

Pierce Transit is currently taking delivery of three electric buses in 2018, and more are anticipated over time as this vehicle type gains in popularity and use. The charging stations for the initial new buses are located where the western-most electric buses are located in the Master Plan. This will allow them to be constructed in 2018, prior to the completion of phase 1A.

Once the revenue lot expansion is completed, additional electric vehicles can be located in this area as well and will use the installed infrastructure. This will preserve the investment being made in the chargers by installing them where they will not have to be relocated once the bus lot is expanded.

NEW DETAIL CLEAN FACILITY

Detail cleaning currently takes place either along the east edge of Building 1 (outside the dynamometer bays) or on the bus vehicle lot. This practice exposes cleaning crew to additional risk of pedestrian vehicular accidents, this also requires the vehicles to remain running during cleaning in the winter and summer months to provide for employee comfort, but this practice wastes fuel.

To address this, and to further reduce congestion in the revenue vehicle flow, A new detailed clean facility is proposed north of Building 1 as shown. The new facility will have 8 detailed clean positions under a canopy and enclosed space for support spaces such as storage and central vacuum equipment. The detailed clean bays are configured at an angle to provide adequate vehicle circulation space for access. Note that the right rear of each bus extends beyond the canopy above so that bus exhaust goes directly to the outdoors without the need for exhaust hoses.

The existing public CNG fueling station in this location, which is accessed from 94th St SW to the north of the Main Base, is no longer in use. This facility will be demolished to make way for the new detail clean facility.

BUS LOT REORIENTATION/RESTRIPING & ENTRY RECONFIGURATION

The site plan in the preferred alternative rotates the bus parking 90-degrees from the current orientation so that buses face east when they return to the site and face west after they have been serviced. In addition the new striping pattern will allow for 14’ wide spaces instead of the current 12’ wide spaces. This spacing has significant advantages, including:

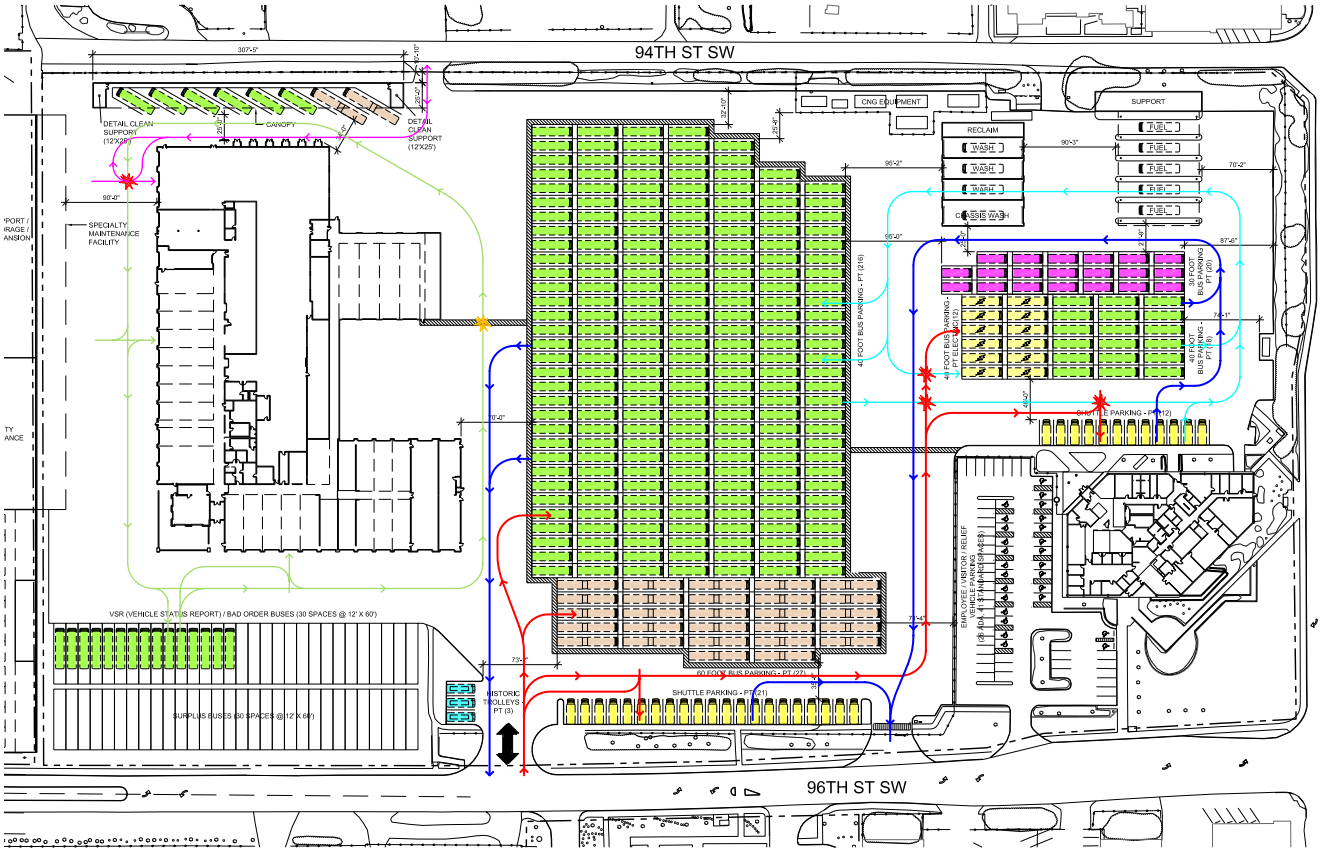
- Additional space between vehicles to minimize accidents and minor vehicle damage
- More space will allow for greater visibility for employees and less risk of pedestrian accidents
- 14’ wide spaces allow for required exercising of the handicapped ramp of each vehicle prior to leaving the parking space
- 14’ wide spaces allow for future installation of lighting or other infrastructure

Vehicle spacing has a direct impact on the parking capacity of the base for revenue vehicles. The calculated Vehicle Equivalent (VE) capacity of the base in the Preferred Alternative is calculated using 14’ wide spaces. Assuming that the Sound Transit fleet is reduced as the Pierce Transit fleet continues to grow, 14’ wide spacing will still allow for the entire PT fleet to fit on this base. Refer to the 2040 vehicle parking diagram for information on the number and mix of fleet vehicles assumed at 14’ wide spaces.

The existing bus exit is relocated to the west and becomes the primary bus entry and exit. This provides additional queuing space from the intersection of South Tacoma Way and 96th Street SW for revenue vehicles. This also corresponds with the revised circulation diagram, allowing for vehicle parking direction to continue as the primary indicator that a vehicle has been serviced. Refer to the vehicle parking and circulation diagram.

VSR/BAD ORDER/SURPLUS PARKING EXPANSION

The existing maintenance employee parking lot will be filled to be level with the bus circulation drive south of Building 1. This area is paved with concrete and will be the designated parking area for VSR, Bad Order, and Surplus buses with 60 spaces sized to accommodate articulated buses.



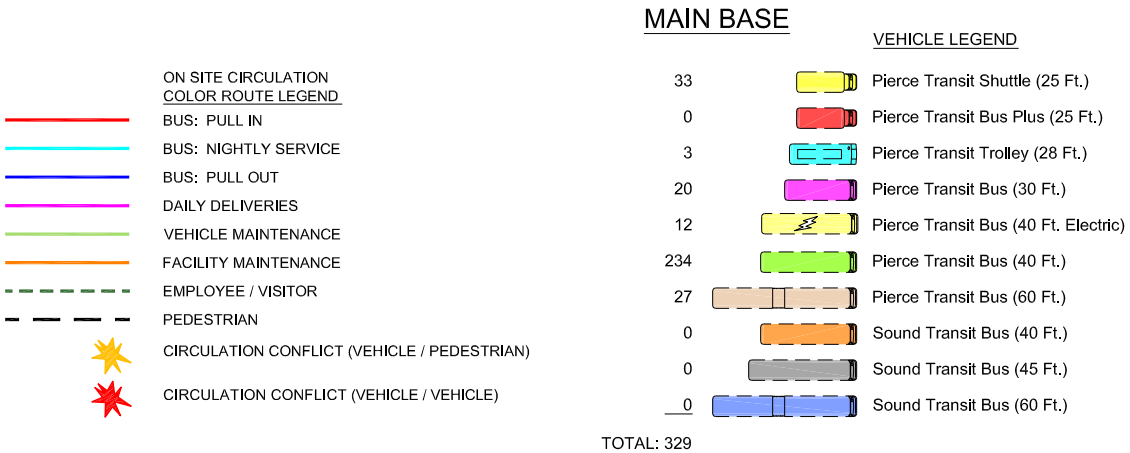


FIGURE 6-2 REVENUE VEHICLE PARKING AND CIRCULATION AT THE COMPLETION OF ALL PHASES

MAINTENANCE BUILDING (BUILDING 1) IMPROVEMENTS

In the Preferred Alternative Building 1 is retained, expanded and comprehensively renovated to continue to serve the fleet maintenance needs and extend the useful life of this existing building. This work takes place in two phases, a building addition in the short term, and a long term comprehensive renovation facilitated by the new west base building.

Building 1 directly impacts the maintenance capacity of the overall base. The configuration of bays and building and warehouse size directly impact the operational efficiency and capacity of the base. As such, improvements to Building 1 are core to capacity increase, safety and employee retention. Bringing the maintenance building up to industry standards is a core need for the Agency in the long-term.

BUILDING 1 ADDITION

In this initial project, Building 1 is expanded to the east with four drive-through bays plus support space to accommodate repair of articulated buses. The addition also provides bay space for radio repair or other campaign related uses in the short term if desired. The building addition will be constructed with a seismic and mechanical systems separation from the main building, and will be structurally isolated to avoid triggering a substantial alteration of the existing Building 1. Materials, structure and cladding for the addition will match the existing building in type and character.

FIGURE 6-3 BUILDING 1 PROPOSED FLOOR PLAN – PHASE 1B COMPLETE

BUILDING 1 RENOVATION

In this supplemental phase, the interior of Building 1 is completely renovated with Component Rebuild being relocated as shown to allow the parts storeroom to be expanded. This assumes that body repair and paint; the tire shop, storage, and bay; shuttle maintenance; and NRV/Vanpool maintenance are all relocated to a new facility on the West Base. During this comprehensive renovation:

- Bays 1N and 12S are converted to a drive through chassis dynamometer bay to accommodate articulated buses.
- Bays 2N and 11S will continue to be used to accommodate repairs of articulated buses.
- The warehouse function is significantly expanded to meet industry standards.
- Warehouse entry (shipping and receiving area) is re-oriented to allow for delivery vehicles to access the building from the west, separating private delivery vehicle flow away from the primary circulation of revenue vehicles. Note that delivery vehicles currently mix with bus traffic in the bus parking area and around the east side of maintenance, which are high traffic areas. The new configuration will allow delivery vehicles to access the site from 94th Street SW and avoid traversing the bus parking area.

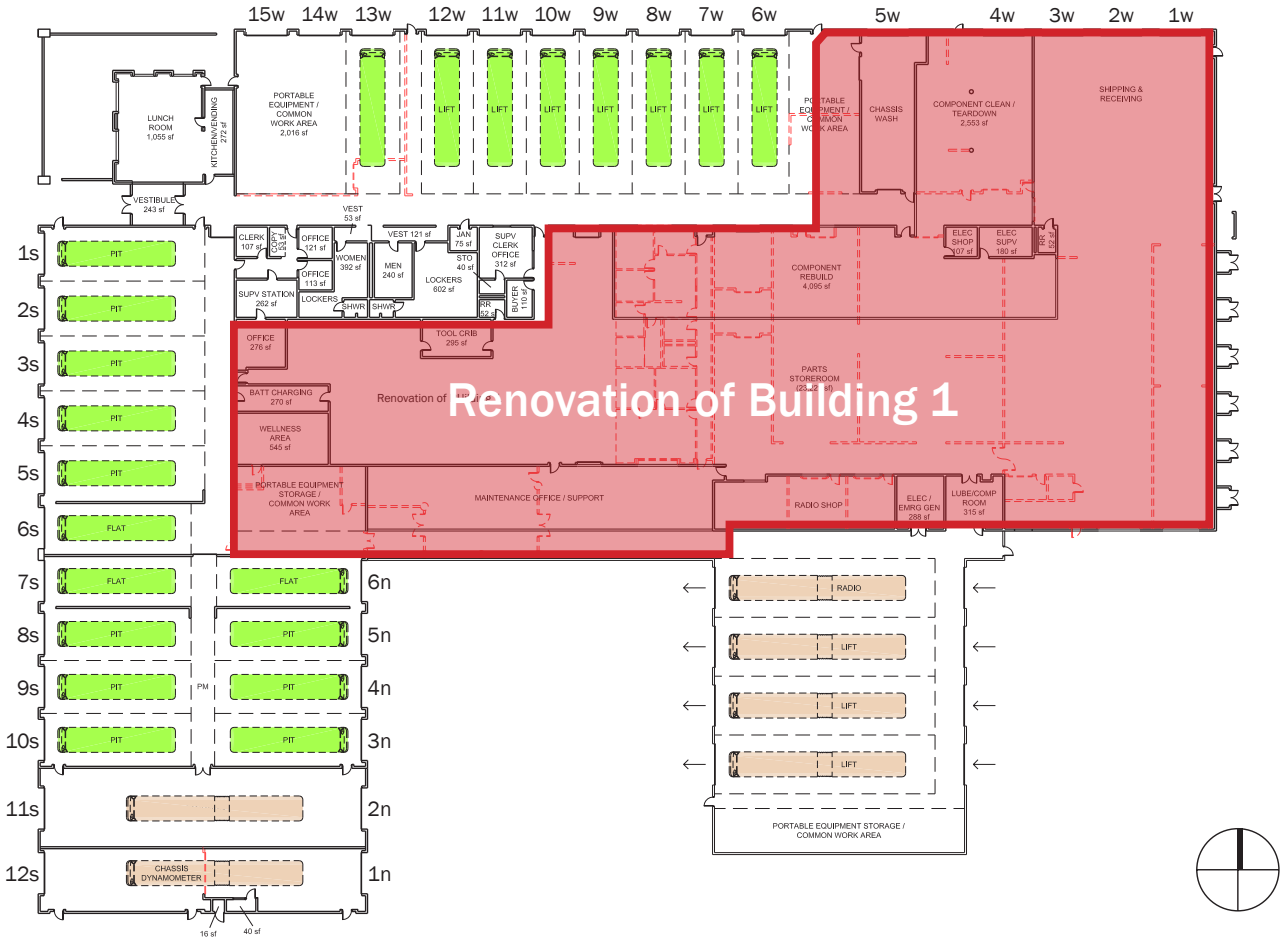


FIGURE 6-5 BUILDING 1 PROPOSED FLOOR PLAN – COMPLETE

It is also assumed that building systems in Building 1 are comprehensively renovated during this phase of the project to extend their useful life. This includes replacement of electrical, mechanical, fueling, and exhaust systems. Existing envelope improvements will be required in areas where the envelope is exposed during renovations. Automatic doors may be replaced with less specialized types to minimize damage and replacement costs.

ADMINSTRATIVE BUILDING (BUILDING 4) IMPROVEMENTS

Maintaining and investing in Building 4 in its current location is a core value of the Preferred Alternative. Keeping the building in this location on the Main Base site ultimately limits long term capacity of the site and requires expansion of the visitor, handicapped and relief vehicle parking lot to the south and east of the existing building to replace spaces displaced by the conversion of the administrative parking lot to revenue vehicle parking. It does preserve the considerable investment embodied in the existing building and recent tenant improvements to the operator's lobby and dispatch areas. There are two sub-projects proposed that will affect Building 4, as described below.

BUILDING 4 RENOVATION

In the short term, Building 4's workplace environments are renovated and improved through tenant improvement refresh of finishes and materials to extend the useful life of the building. New ceilings, lighting, flooring, and minor modifications to walls and suites within the building will greatly benefit the overall work environment for administrative employees. This initial phase is intended to address the condition of the workplace without impacting or significantly changing major building systems, and without triggering a Substantial Alteration threshold.

This renovation phase will also include standardization of furniture elements, integration of more collaborative space and an update to the workplace environment for all administrative departments. Where possible, suites within the building will be combined for greater flexibility. Additional conference room and small meeting room spaces will be added to the floor plan in central areas. Ideally, tenant improvements would be planned in relation to the future building addition.

During the departmental interviews, most groups expressed openness to transitioning to an open office environment with some caveat that private offices or accessible one-on-one meeting spaces are still needed for private consultation. Furniture changes and standardization during this phase will improve worker satisfaction and contribute to a healthier work environment and improved ergonomics, with the ultimate goal of improved employee satisfaction and retention.

BUILDING 4 ADDITION / COMPREHENSIVE RENOVATION

In the long term, a 12-15,000 square foot addition will be constructed to the south of Building 4 to contain all necessary expansion space for the agency's administrative departments. This addition will also be coupled with a comprehensive renovation of the major building systems, including mechanical, electrical and telecom. The building addition may be able to be constructed as a standalone building from a structural perspective to avoid a full seismic upgrade of the existing structure. A full analysis of the potential structural implications and feasibility of this approach is beyond the scope of this study.

A detailed programming study for the Building 4 addition has not been completed. However, the addition could contain communications and training functions, placing them adjacent to the current operator's lobby and recreation areas. This concept, identified by the stakeholder group, would create

a driver focus to Building 4 over the long term, bringing drivers, supervisors, trainers and communication personnel into closer contact and fostering safety and a collaborative culture and environment.

The Building 4 Addition:

- Addresses seismic and other systems deficiencies in the existing building, effectively extending its useful life for the Agency and reducing risk of catastrophic damage during a major seismic event.
- Provides up-to-date communications and telecom infrastructure, and improves hardening of current technology systems and equipment in case of emergency.
- Could consolidate operations, communications and training into a single facility to improve communication between these departments and enhance long-term retention and recruitment by providing a state-of-the-art transportation services facility.

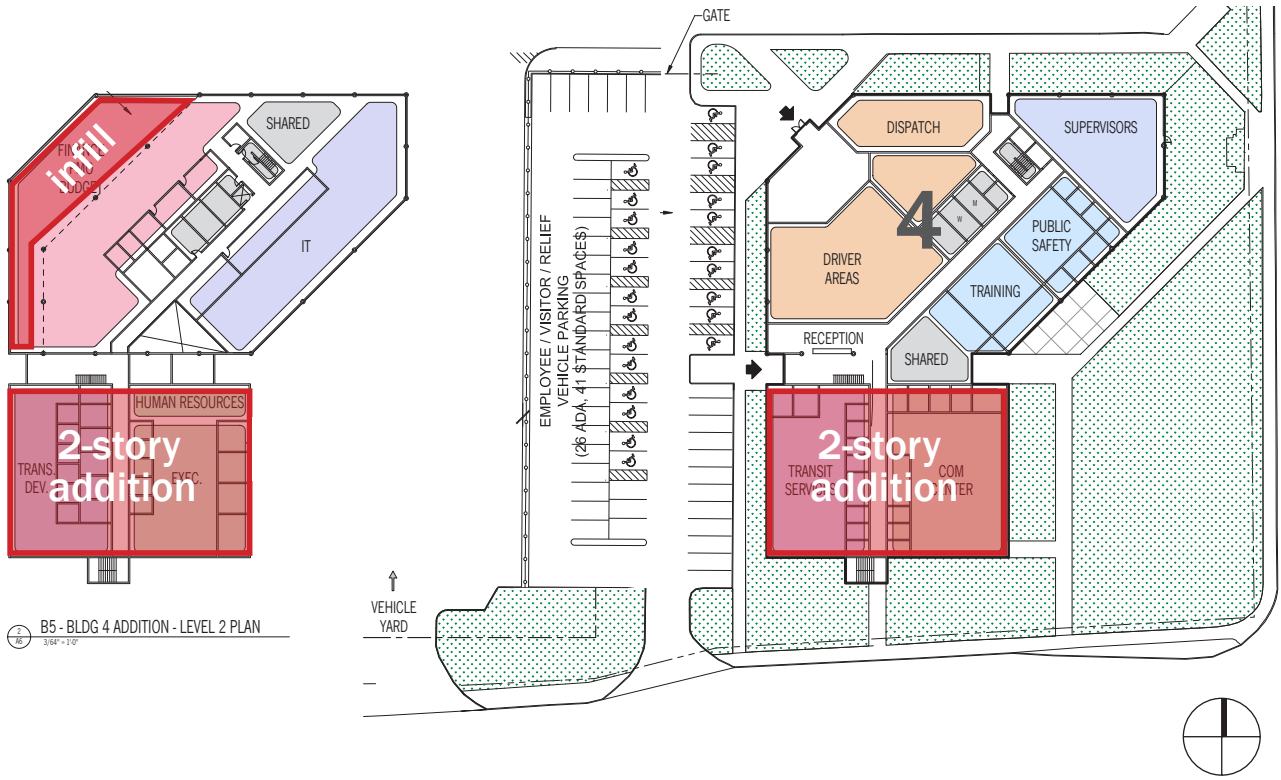


FIGURE 6-6 BUILDING 4 ADDITION AND RE-PROGRAMMING CONCEPTS

SOUTH BASE IMPROVEMENTS

The existing South Base parking lot is expanded southward into the undeveloped portion of the South Base to accommodate all employee parking, including administrative staff, operators, and maintenance employees. In addition to this primary project, pedestrian improvements and a new vehicular connection to 100th St SW are proposed to serve this newly expanded use.

SOUTH BASE PARKING EXPANSION

Scope includes expansion of the South Base employee parking lot to a total of approximately 650 stalls. The existing lot will also be restriped and lighting modified to facilitate a more efficient layout and to add a central pedestrian pathway. Landscaping islands are added to bring the south parking lot up to current land use code compliance.

This consolidation removes employee vehicles from the Main Base to maximize revenue vehicle capacity there. It also provides the secondary benefits of simplifying wayfinding, consolidating security for employee parking, and provides flexible space for overflow during construction of future phases/ sub-projects.

STORMWATER POND AND CONNECTION TO 100TH STREET SW

Expansion of the existing parking lot will require development of the existing undeveloped portion of the site to both provide the additional area required for the parking lot, and to accommodate a new stormwater detention pond. This concept was explored previously in the 2008 South Base Expansion Plan. As described in the Site Analysis section, an updated review with the Army Corps of Engineers and Department of Ecology on the regulatory status of the existing water features and natural areas present on the South Base has been conducted. These do not appear to present a barrier to future development on this portion of the base.

A new driveway connection to 100th street SW is also proposed. This connection will provide options for employees to enter and exit from the south end of the base, reducing traffic along 96th street and lowering employee vehicle traffic volumes at the already busy pedestrian crossing to the Main Base. A fence and automatic gate will be provided at 100th St SW.

Per land use code, existing significant trees will be retained wherever possible to meet the city's land use code requirements for the preservation of existing trees. Trees that must be removed will need to be replaced per the ratios established by the code.

PEDESTRIAN CROSSING IMPROVEMENTS

Once all employees will be required to arrive at the South Base parking lot and transition to work on the Main Base, many will be using this pedestrian crossing. This crossing serves as the only major N-S connector between the two major adjacent areas of the base. This scope of work includes a series of optional improvements to this crossing to enhance pedestrian safety.

A traffic study was commissioned to evaluate the crosswalk volumes and cross-traffic, and the safety improvements currently in place at this important crossing. The study found that the current safety equipment is adequate for the use, and based on industry standard, no improvements are required or warranted. The study can be found in Appendix E.

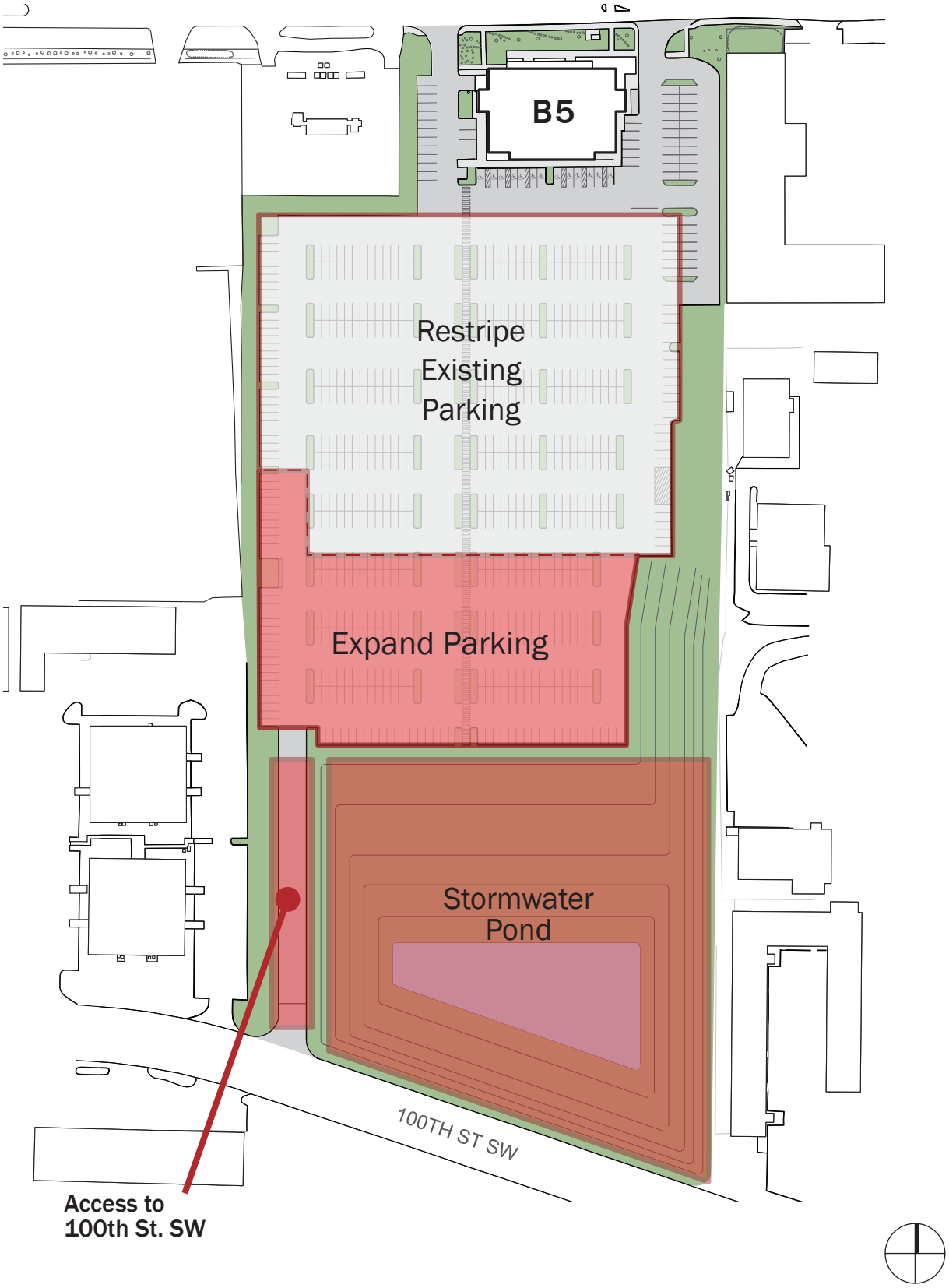


FIGURE 6-9 SOUTH BASE EXPANSION DIAGRAM

BUILDING 5 IMPROVEMENTS

Building 5 is the newest building on the base and as such is in the best condition (as indicated by its FCI score (see Figure 4-8 FCI Score Summary Table on page 55.) As a result very little is proposed in the short term for this building in the master plan. Over the longer term, Building 5 workplace environments will be renovated and improved through tenant improvement refresh of finishes and materials to extend the useful life of the building, and to accommodate administrative needs.

BUILDING 5 RENOVATION

Scope includes new ceilings, lighting, flooring, and minor modifications to walls and suites within the building to meet administrative needs. New meeting and collaborative spaces are added along the central corridor on levels 1 & 2. Training rooms on level 1 are refreshed and updated. Comprehensive renovation of the existing building systems is not anticipated.

Once the Building 4 addition is completed, more operator related functions may be relocated to Building 4 in order to be proximate to the drivers and operations. As more operator related functions are relocated to Building 4, administrative functions that do not need proximity to the revenue vehicles can be relocated to Building 5. This will relieve the pressure on the Building 4 parking lot and may provide a mechanism for all desired internal adjacencies to be realized.

A detailed program study of potential departmental adjacencies and floor plan concepts is beyond the scope of the Master Plan Update and will be undertaken at a future date.

WEST BASE IMPROVEMENTS

The West Base provides an ideal location for maintenance facility expansion. A new maintenance facility and dedicated parking area is proposed along the western edge of the Main Base. Both existing buildings will be demolished.

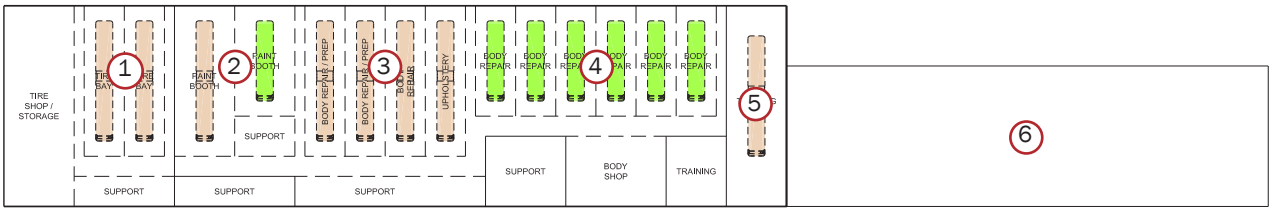
WEST BASE MAINTENANCE FACILITY

The West Base has a new two-level 83,000 square foot maintenance facility. The upper level is accessed along the east side from the Main Base and the lower level is accessed from the west side from the new West Base parking area. The upper level has a new tire shop with two bays, a new body repair and paint shop, and maintenance training. The lower level has Facilities Maintenance, SHUTTLE maintenance, and NRV/Vanpool maintenance. A new emergency generator is also proposed for West Base.

The West Base has parking for the entire Facilities Maintenance fleet, SHUTTLE downline and reserve, SHUTTLE incoming and outgoing vehicles, NRV/Vanpool downline and reserve, and NRV/Vanpool incoming and outgoing vehicles. Access to the West Base parking area is from 39th Avenue Ct SW.

Note that the proposed facility includes space for both Vanpool and Facilities Maintenance as well as their vehicles. This would allow the remotely located Building 6 to be repurposed or sold once West Base is complete. During the Building 6 program study, it was determined that either Facilities maintenance or Vanpool could be located in Building 6 in the future. Either would reduce the scope and cost of the West Base facility, but would require the retention of Building 6.

The existing bus parking west of Building 1 will be relocated to the new parking area south of Building 1. This will allow buses to directly access the proposed new maintenance facility on the West Base from the Main Base.



level 2

level 1

LEGEND

1	Break Room	6	Roof
2	Van/Auto	7	Support/Storage
3	Parts Mezzanine	8	Facilities Maintenance
4	Body Repair	9	SHUTTLE Maintenance
5	Training	10	NRV Vanpool Maintenance

FIGURE 6-10 WEST BASE FLOOR PLANS

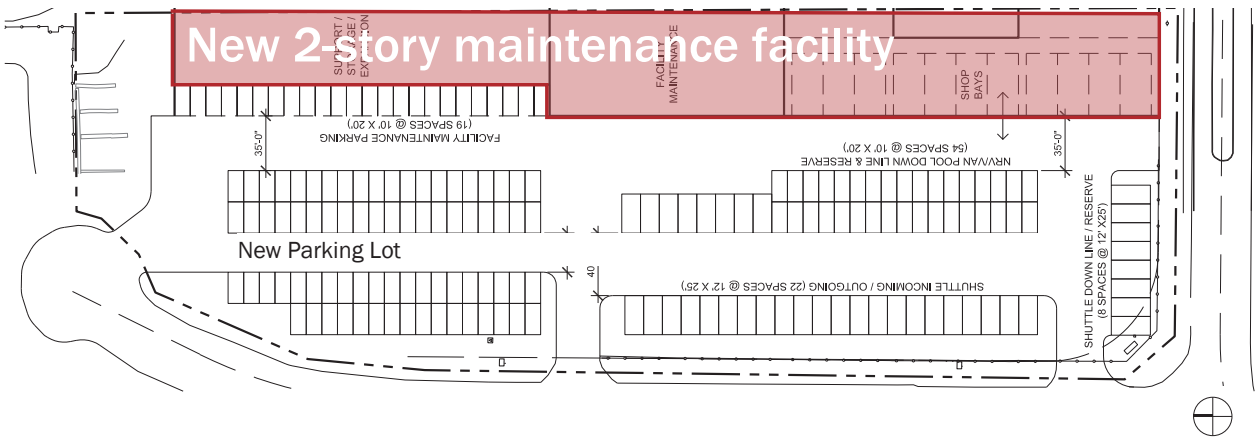


FIGURE 6-11 WEST BASE PARKING CONCEPT

6.3 IMPLEMENTATION & PHASING

IMPLEMENTATION & PHASING

Transit operations at Pierce Transit must continue without interruption throughout construction. A phasing plan was developed to show how the preferred alternative could be phased to accomplish this goal while meeting the needs of the fleet as it evolves. The phasing plan also addresses specific needs discussed with Pierce Transit including breaking down the whole project into sub-phases for which securing funding may be more attainable.

An overall implementation schedule was developed showing start and end dates and duration for planning, design, and construction for each phase and sub-phase. The schedule also shows those activities that are related to other activities and those activities that are stand-alone.

The implementation schedule assumes the most aggressive timetable possible within the site constraints. Design phases begin before construction of the previous phase is complete. Projects that can run concurrently without significantly impacting operations are shown overlapping. Construction on major projects begins as soon as the completion date of the previous phase or major project is reached. As a result, the implementation schedule represents the fastest schedule that could be attained, irrespective of available funding or agency resources.

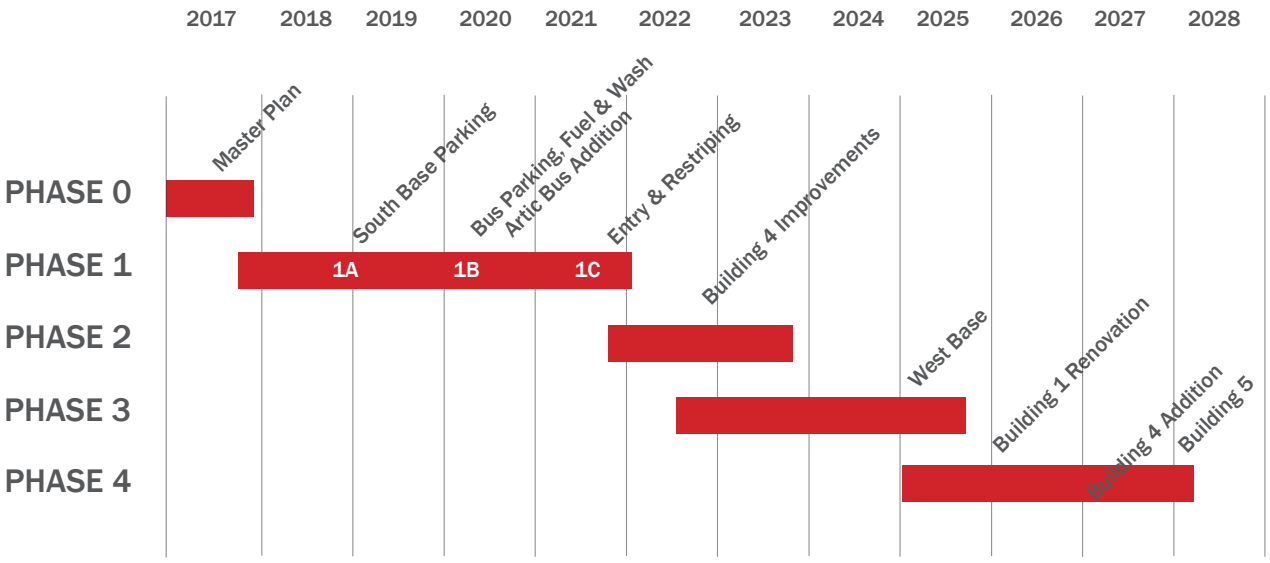


FIGURE 6-12 MILESTONE SCHEDULE

PROJECT SEQUENCE & PACKAGING

As the agency begins to plan projects in alignment with their budget cycle this timeline will necessarily be extended or modified. However, the overall sequence of projects, and how they relate to one another must be considered carefully whenever making decisions about what to move forward with. The following descriptions of each phase summarizes the implementation approach and project scope of each project.

PHASE 1

Phase 1 projects focus on increasing vehicle capacity and improving safety on the Main Base. This is accomplished by expanding the bus parking and use areas on the Main Base, consolidating and relocating employee parking out of the Main Base, and by providing higher capacity facilities at pinch points.

The implementation schedule shows the design and permitting for all of Phase 1 to be accomplished at the same time, with construction "packages" or sub-phases as described below that can then be released in the ideal sequence or by which trades are dominant. This will allow:

- The construction packages to be coordinated properly from the beginning as they will be designed concurrently.
- The sequencing and content of each package to be adjusted as necessary to respond to evolving needs and funding availability.
- Work to be packaged in the most cost effective manner while meeting Pierce Transit's needs by minimizing mobilization and demobilization of trades, which should minimize cost.

The estimated cost of construction for all of Phase 1 can be updated based on more detailed design, which will provide Pierce Transit more accurate information for budgeting and securing funding as projects are released.

PHASE 1A

EXPAND SOUTH BASE PARKING AND CONNECT TO 100TH STREET SW

In order to vacate the employee parking lot north of Building 4, the parking lot on South Base should be expanded first so that only one move would be required. This work includes re-striping portions of the existing lot to maximize efficiency, and also requires re-grading and site development along the south portion of the South Base parcel to develop a stormwater pond for water quality and detention. A driveway connection to 100th Street SW will also provide more circulation options and access for employees away from the revenue vehicle flow in the near term.

- Starting with the South Base allows for minimal disruption and inconvenience to employees during construction of South Base because the admin parking lot will still be in use.
- This approach guarantees space for all employee vehicles as well as the current surplus vehicles and miscellaneous NRV stored on South Base.
- Because the South Base lot will not be at capacity during construction, areas can be cordoned off or separated for paving, lighting and striping changes without impacting employee parking.

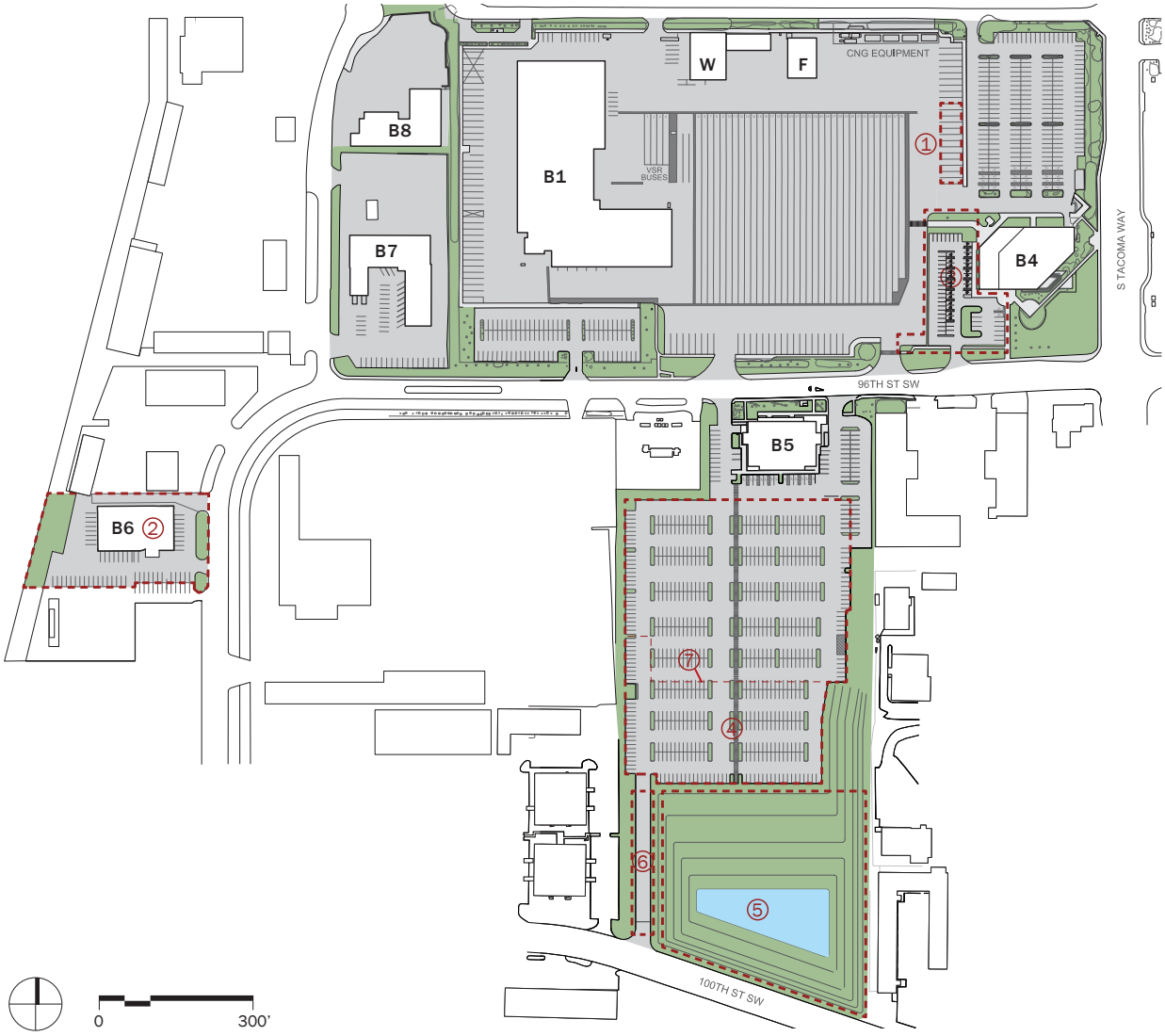
Pierce Transit is currently exploring ways to move Vanpool vehicles and other non-employee vehicles from the current South Base parking lot to allow the lot north of Building 4 to be vacated sooner. This approach was tested by the Master Plan team and *is* feasible, although parking on the existing South Base would be at a premium and other non-employee surplus parking use would have to be relocated.

- If this alternate phase 1 sequence is pursued, then the south base expansion could be moved to Package 1C later in the sequence once the fuel and wash is completed.
- This may also be advantageous from the design and permitting standpoint, as the South Base will require more mitigation and scrutiny as it is an under developed site.
- Delaying the South Base parking project will require extensive workarounds within the existing parking lot itself at a time when space would be at a premium after the demolition of the administrative parking lot north of Building 4.
- This may require employee incentives for carpooling or disincentives such as paid parking spaces for the period of time prior to completion of the parking expansion and after the demolition of the administrative parking lot north of Building 4.

BUILDING 4 PARKING IMPROVEMENTS

Additional visitor parking spaces are needed and the accessible and relief vehicle spaces currently in the lot north of Building 4 must be replaced when that lot is vacated. Additional parking will be constructed immediately west and southwest of Building 4 as shown.

- This work involves the same trade contractors as the expansion of the South Base parking and could be packaged together to reduce costs.
- This work must occur prior to the vacation of the existing Building 4 administrative parking lot, as the accessible and relief vehicle spaces must remain adjacent to that building.



COLOR LEGEND

- Building Footprint
- Project Boundary
- Pond
- Keynote
- Landscape
- Paving
- New Building Area

PHASE 1A

1. Electric Bus Charging Stations - Phase 1
2. Relocate Vanpool to Building 6
3. Relocate Stalls and Expand Building 4 Administration Parking Area
4. Expand South Base Parking
5. Regrade for Storm Water Treatment & Detention Pond
6. Connect to 100th St SW
7. Previous Parking Lot Boundary

FIGURE 6-14 PHASE 1A

PHASE 1B

After Phase 1A is complete, the bus parking area can be expanded to the east and a new fuel and wash facility constructed. This is a key step in expanding the Main Base bus parking and fueling capacity. The addition to Building 1 is also constructed during this phase, addressing short term maintenance capacity and providing pull through articulated bus bays. A new Detail Clean facility also further streamlines circulation.

(Note: Refer to the Phase 1B Overall Site Plan and 2020/2021 Vehicle Parking Diagram in Appendix B)

EXPAND BUS PARKING / CONSTRUCT NEW FUEL & WASH / ADDITIONAL ELECTRIC CHARGING STATIONS / DEMO EXISTING FUEL (BUILDING 3)

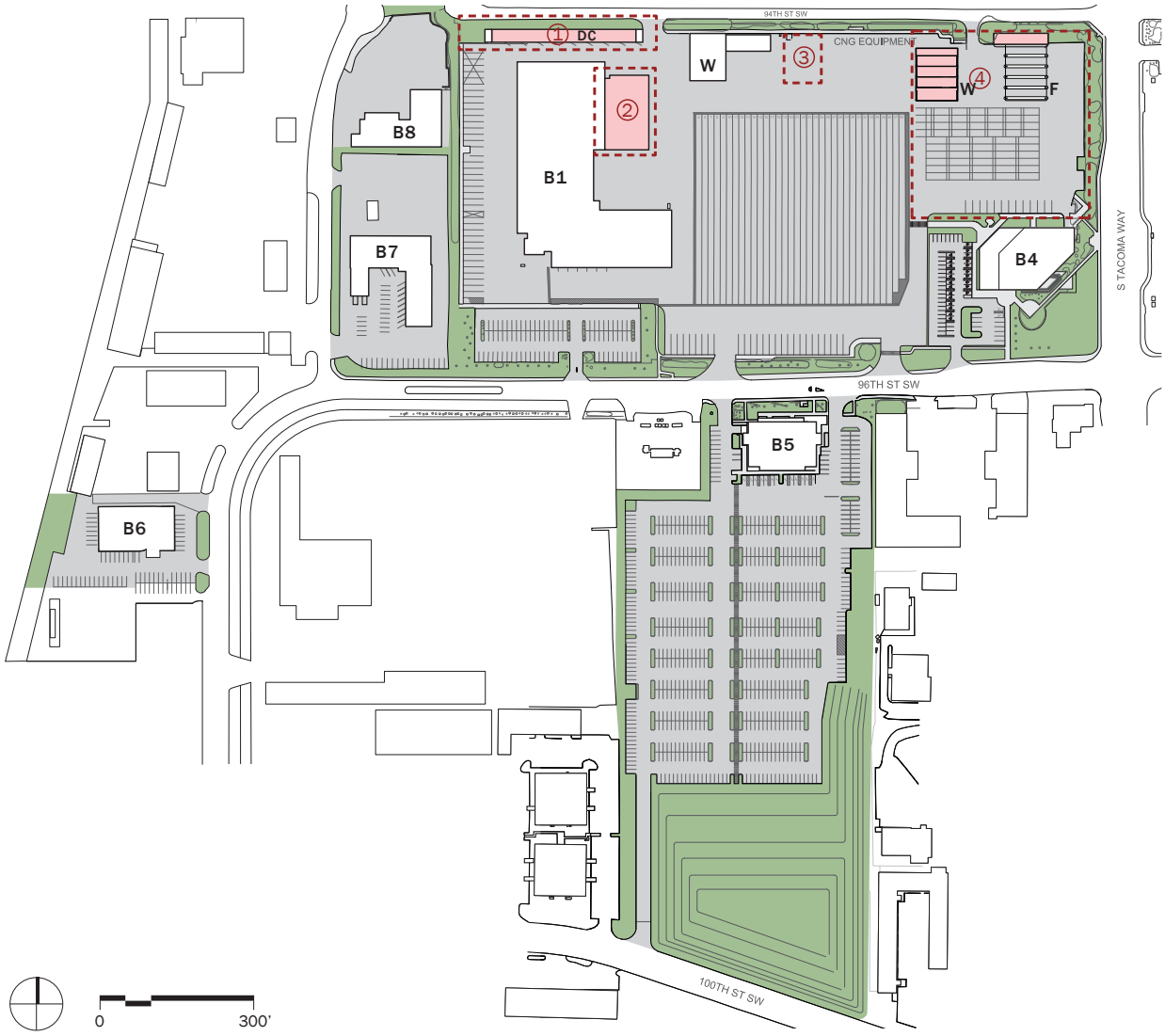
The bus parking lot is expanded to the east over the footprint of the existing admin parking lot. This will require new paving, infrastructure, lighting, and structured detention or infiltration. New fueling and wash facilities are also included.

- Once employee parking is vacated, this entire area becomes available for construction without impacting on-going bus operations. This is especially important because of the already very tight constraints of the existing bus lot.
- The new Fuel and Wash buildings and their support infrastructure can be constructed simultaneously so that construction does not impact on-going operations. This includes construction of new underground fuel storage tanks immediately south of the new Fuel facility.
- After the new Fuel and Wash facility is operational, the existing Building 3 (Fuel) can be demolished, along with the decommissioning of existing underground fuel storage tanks located there.
- This provides additional revenue vehicle parking in that area, or more flexibility with regard to ongoing Facilities operations and NRVs.
- This approach also allows a seamless transition from the old to the new facility. As soon as the new fuel and wash buildings are complete, vehicles can begin using that facility and the existing one is no longer needed.

BUILDING 1 EXPANSION – ARTICULATED BUS REPAIR BAYS

Four drive through bays and associated support space to accommodate articulated buses will be constructed on the east side of Building 1 as shown. This will necessitate removal of the existing four underground storage tanks and replacing them with above ground storage tanks located within the building.

- The articulated bus repair bays provide additional maintenance bay space in the short term to relieve the pressure on Building 1, and increasing the maintenance capacity of the base.
- Providing drive through access for articulated buses reduces the risk of minor accidents and improves safety in the maintenance area.
- Dedicated articulated coach bays are needed immediately to accommodate BRT vehicles and Sound Transit fleet growth.



COLOR LEGEND

- Building Footprint
- Project Boundary
- Pond
- Keynote
- Landscape
- Paving
- New Building Area

PHASE 1B

① Demolish Public CNG and Construct New Detail Clean Facility (DC)

② Construct Building 1 Addition - Articulated Bus Bays and Charging Bays

③ Demolish Existing Fuel Building

④ Construct New Fuel & Wash Buildings and Expand Revenue Parking Area

FIGURE 6-15 PHASE 1B

DETAIL CLEAN FACILITY

A new Detail Clean Facility will be constructed to provide a safe, canopy covered environment for this cleaning function.

- The remaining elements of the unused public CNG fueling facility in the northwest corner of the site will need to be demolished to make way for a new Detail Clean facility, taking advantage of an unused part of the Main Base.
- Construction of the Detail Clean facility can be accomplished outside of the revenue vehicle circulation with access from 94th Street SW.

PHASE 1C

After Package 1B is complete, revenue vehicle space is expanded, and the new fuel and wash are online, the existing lot entry and striping is re-oriented and restriped to provide ideal circulation and industry standard 14' wide bay spacing. Consolidating the revenue vehicle entry/exit point to the west will improve circulation on the bus lot, and will provide additional queuing space during peak pull and return hours by increasing the distance to the South Tacoma Way intersection.

(Note: Refer to the 2022/2023 Vehicle Parking Diagram in Appendix B)

BUS ENTRY / EXIT MODIFICATIONS AND MAIN LOT RESTRIPING

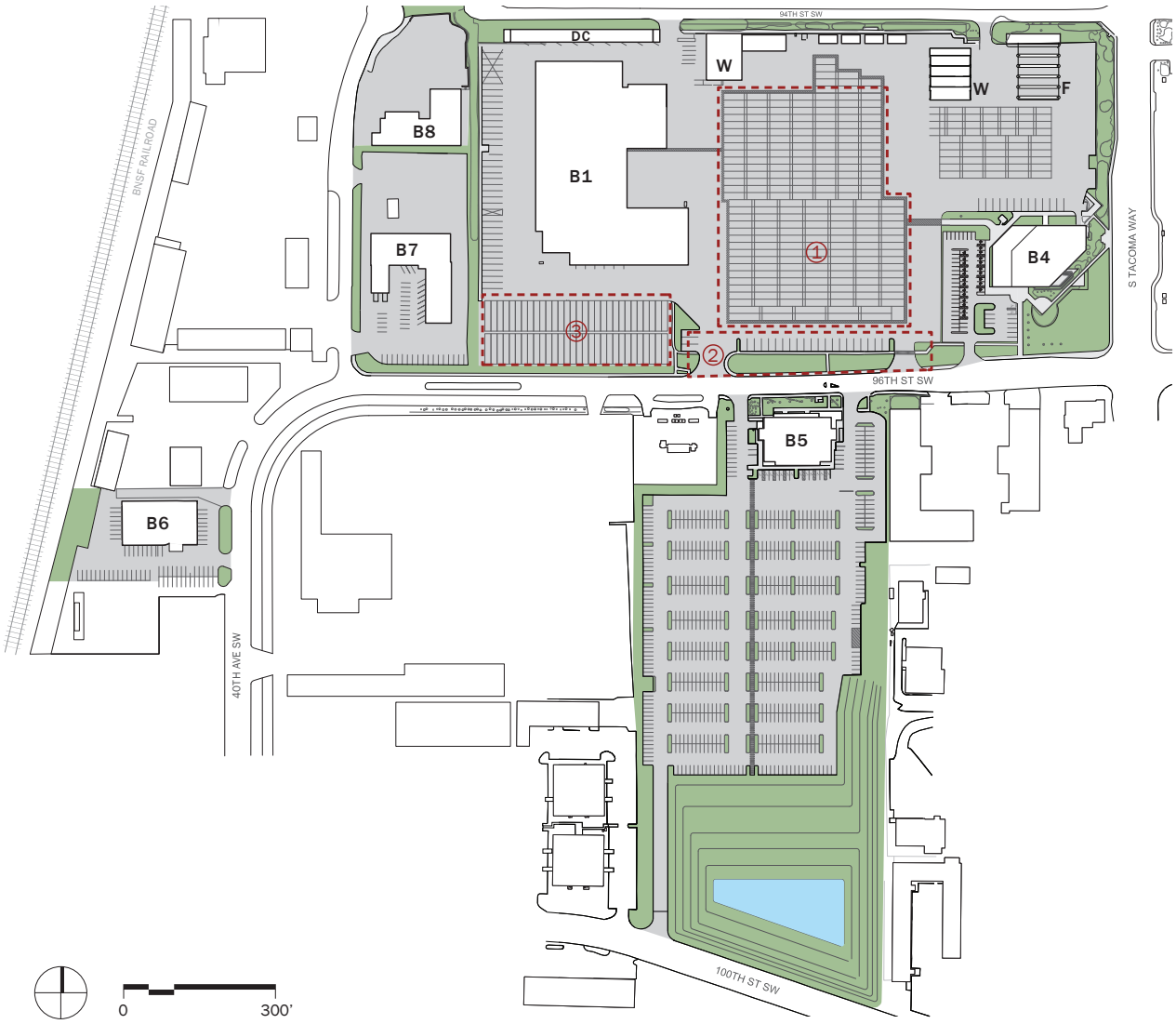
The existing bus exit on 96th Street SW is moved to the west to align with the new bus parking configuration. This work on the entry / exit is adjacent to the existing maintenance employee parking lot, which is the site of the regrading/paving of the new VSR/Bad Order/Surplus bus parking lot. Doing this work simultaneously will minimize disruption and utilize the same trades for a more cost effective construction package.

- After the bus entry/exit is modified, the bus lot can be restriped in the proposed east/west orientation. Note that this may also entail modifying the site lighting to align with the new striping plan. Pierce Transit will need to work closely with the contractor during this restriping work to make sure that on-going operations are impacted as little as possible.
- The reorientation of the bus lot will also require Pierce Transit to train both drivers and mechanics regarding new traffic patterns during pull-in, pull-out, and the nightly servicing cycle.

REGRADE AND PAVE VSR/BAD ORDER/SURPLUS

The new bus parking area created by this regrading and paving will provide space for parking up to 60 articulated buses on the Main Base by consolidating the VSR/Bad Order/Downline vehicles to this new area. This sub-project follows the theme of providing more revenue vehicle capacity on the Main Base. The elevation of the existing maintenance employee parking lot south of Building 1 will need to be raised to be level with the existing bus circulation drive south of Building 1. This may require construction of retaining walls or berms.

- This project follows the South Base expansion (ideally) because maintenance employee parking will be displaced.
- This project will consolidate parking for VSR, Bad Order, and Surplus buses in one location.
- This work must be done before the new maintenance facility can be constructed on the West Base (see Phase 3)



COLOR LEGEND

- Building Footprint
- Project Boundary
- Pond
- Keynote (X)
- Landscape
- Paving
- New Building Area

PHASE 1C

1. Revenue Vehicle Restriping to 14' Spaces and Lighting Improvements
2. Entry Improvements and In-Out Reversal
3. Regrade and Pave for Bad Order, Surplus, VSR Parking, Convert to Revenue Vehicle Lot

PHASE 2

FIGURE 6-16 PHASE 1C

Phase 2 includes primarily workplace environment improvements to the administrative areas of the Agency, and preparatory work leading into the more significant project of the West Base Maintenance Facility in Phase 3. The workplace environment improvements could be undertaken sooner or later depending on agency preference and priorities.

PEDESTRIAN CONNECTION ENHANCEMENTS

Once Phase 1 is complete, all administrative, operations and maintenance employees will use this pedestrian crossing to reach their place of work on the Main Base. This project involves crossing improvements to minimize conflicts and improve flow of both pedestrians and vehicles through this crossing.

- This work can be undertaken at any time.
- Based on current and predicted traffic flows this work is not mandated or warranted by standard practice, and is not required to be completed concurrent with the South Base improvements.

BUILDING 4 & 5 WORKPLACE IMPROVEMENTS

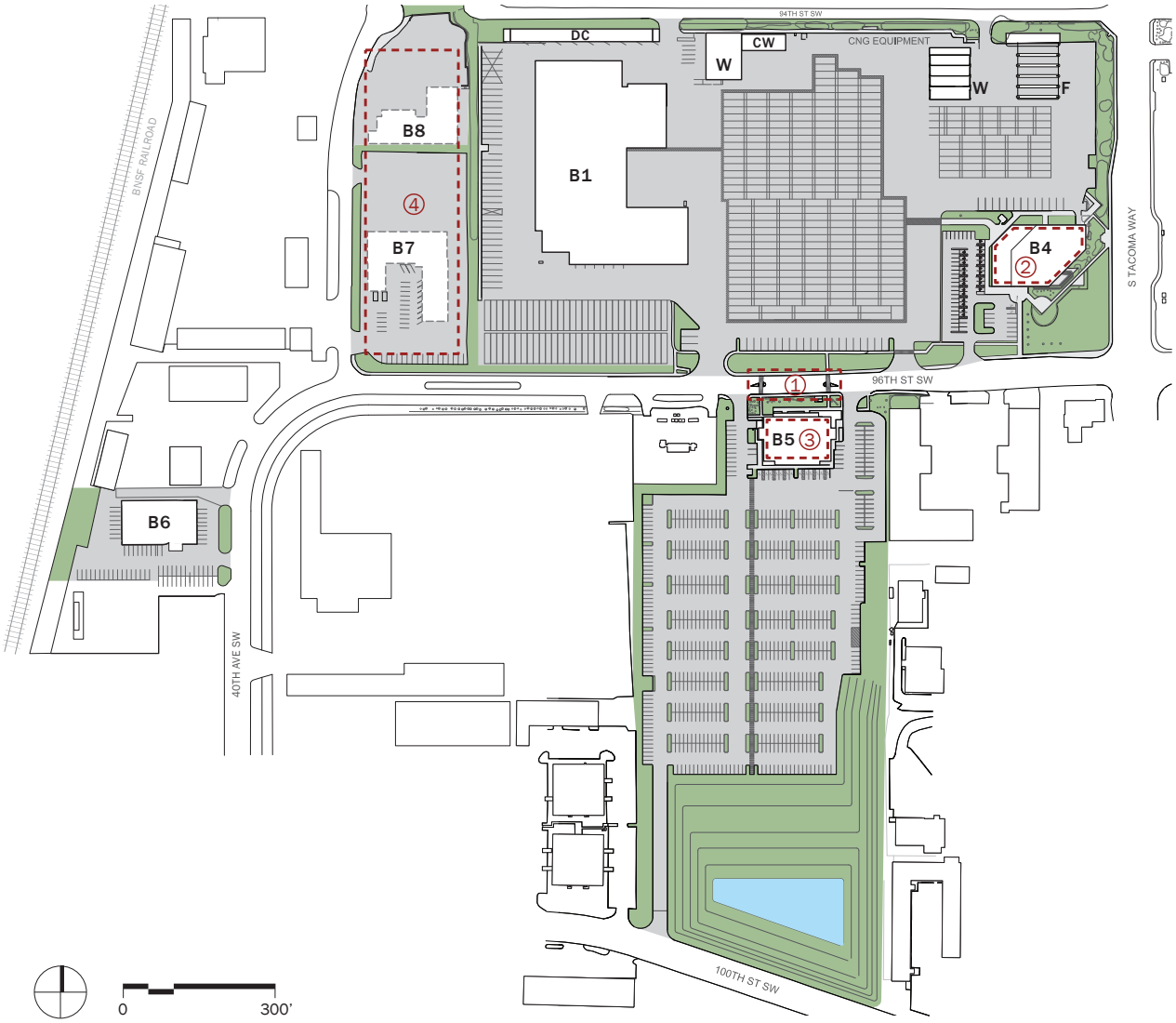
These tenant improvements will provide more collaborative working space and flexibility for all departments, will add enclosed conference room space and refresh finishes and working environments, and will re-evaluate and improve furniture and workplace standards to maximize flexibility and efficiency within the two administrative buildings.

- This work can be undertaken at any time or sub-phased.
- Tenant improvements will be designed to accommodate the future addition and more comprehensive renovation work included in Phase 4. Depending on funding availability and agency interest the addition and renovation work could also be undertaken simultaneously to minimize cost.

DEMOLITION OF EXISTING WEST BASE PROPERTIES

In preparation for the West Base Facility project it is anticipated that a demolition phase and subsequent environmental remediation or assessment may be needed prior to the re-development of the two building sites.

- This work can occur at any time prior to the West Base Facility construction.
- Note that design and this pre-demolition phase of work related to the West Base Facility begins during Phase 2 so that the West Base Facility can begin construction as soon as funding is acquired.



COLOR LEGEND

- Building Footprint
- Project Boundary
- Pond
- Keynote (X)
- Landscape
- Paving
- New Building Area

PHASE 2A

① Pedestrian Connection Improvements

② Buildings 4 Workplace Improvements

③ Buildings 5 Workplace Improvements

④ Demolish Screaming Eagle and West Base

FIGURE 6-17 PHASE 2

PHASE 3

Phase 3 includes construction of a new two-level maintenance facility on the West Base and additional revenue vehicle parking expansion in the area vacated by Building 2.

(Note: Refer to the 2027 Vehicle Parking Diagram in Appendix B)

WEST BASE MAINTENANCE BUILDING

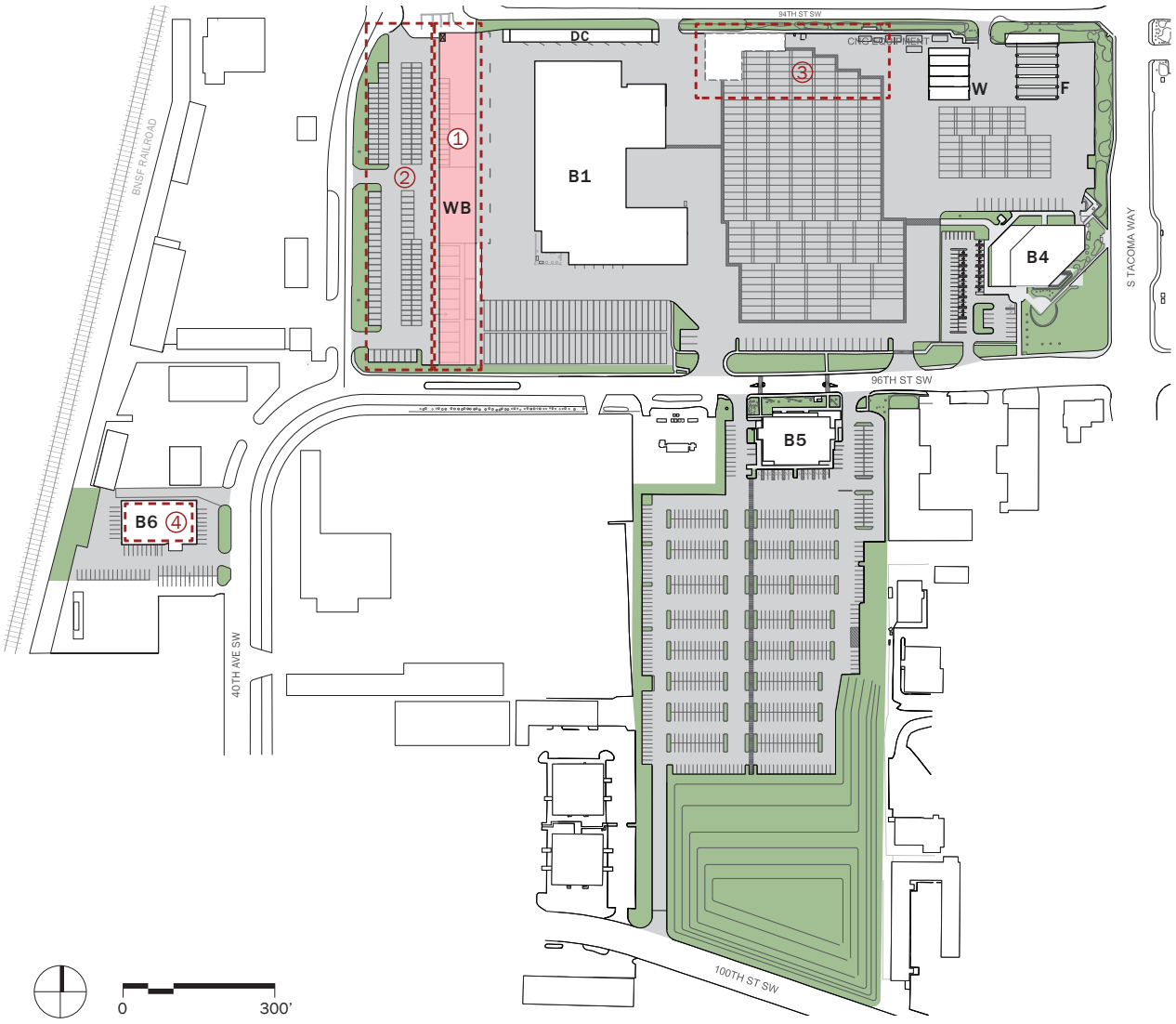
Construction of a new two-level maintenance building along the west edge of the Main Base.

- Construction can be completed without impacting ongoing revenue vehicle operations.
- This project will provide surge space for ongoing maintenance operations during renovation of Building 1 in the next phase.
- Allows for a long-term home for both Vanpool and Facilities in the lower level, including offices, parking and support spaces, depending on the selected program.
- Site work, and structural work packages could be released during the design phase to expedite delivery (assumes a GCCM delivery model).

DEMOLITION OF BUILDING 2 / RELOCATION OF FACILITIES TO BUILDING 6 (OPTIONAL)

Because the West Base Facility includes space for both Facilities and Vanpool (as well as parking for both departments), the buildings where these two functions reside are no longer needed after the completion of the West Base building.

- This will allow for demolition of Building 2, which then provides more revenue vehicle parking and capacity on the Main Base and improves safety by removing Facilities NRVs from the revenue lot.
- The West Base building also includes dedicated space for the Vanpool program on the West Base, which would allow for other uses in Building 6, or the eventual sale of that remote property.
- Through the Building 6 utilization study (see Appendix L) it was shown that Building 6 could also be used for Facilities Maintenance if a separate facility for that function was desired, or if that was a more cost effective approach to the design of the West Base Maintenance Facility.



COLOR LEGEND

- Building Footprint
- Project Boundary
- Pond
- Keynote
- Landscape
- Paving
- New Building Area

PHASE 3

1. Construct West Base Maintenance Facility
2. West Base Parking - NRV/Vanpool/ SHUTTLE/Facilities Maint & Auto Downline
3. Demolish Wash Facility and Facilities Maintenance and Expand Revenue Parking
4. Facilities Maintenance to Building 6 (Optional) or Surplus

FIGURE 6-18 PHASE 3

PHASE 4

(Note: Refer to the 2032, 2037 & 2040 Vehicle Parking Diagrams in Appendix B)

Phase 4 includes the comprehensive renovation of Building 1 and the comprehensive addition and renovation of Building 4 to accommodate administrative growth. Comprehensive renovation of Building 1 is the final step in achieving industry standard facilities in the warehouse and affected maintenance bays. Both projects represent the final step in realizing the complete Base Master Plan.

BUILDING 1 RENOVATION

This project follows the construction of the West Base and includes a comprehensive renovation of the oldest portions of Building 1 to provide vastly expanded warehouse space (to reach industry standard), as well as reconfigured office and component rebuild space within Building 1. Also included is a comprehensive renovation of the building systems to meet contemporary standards or safety and performance, thus extending the useful life of Building 1.

- Requires paint booth and body repair space to be constructed within the new West Base Facility.
- Includes potential warehouse access improvements and a new service entrance to the Main Base via 94th Street SW.
- This project is the final step in bringing all maintenance facilities up to industry standard and extending their useful life to the 2040 threshold.

BUILDING 4 ADDITION AND RENOVATION

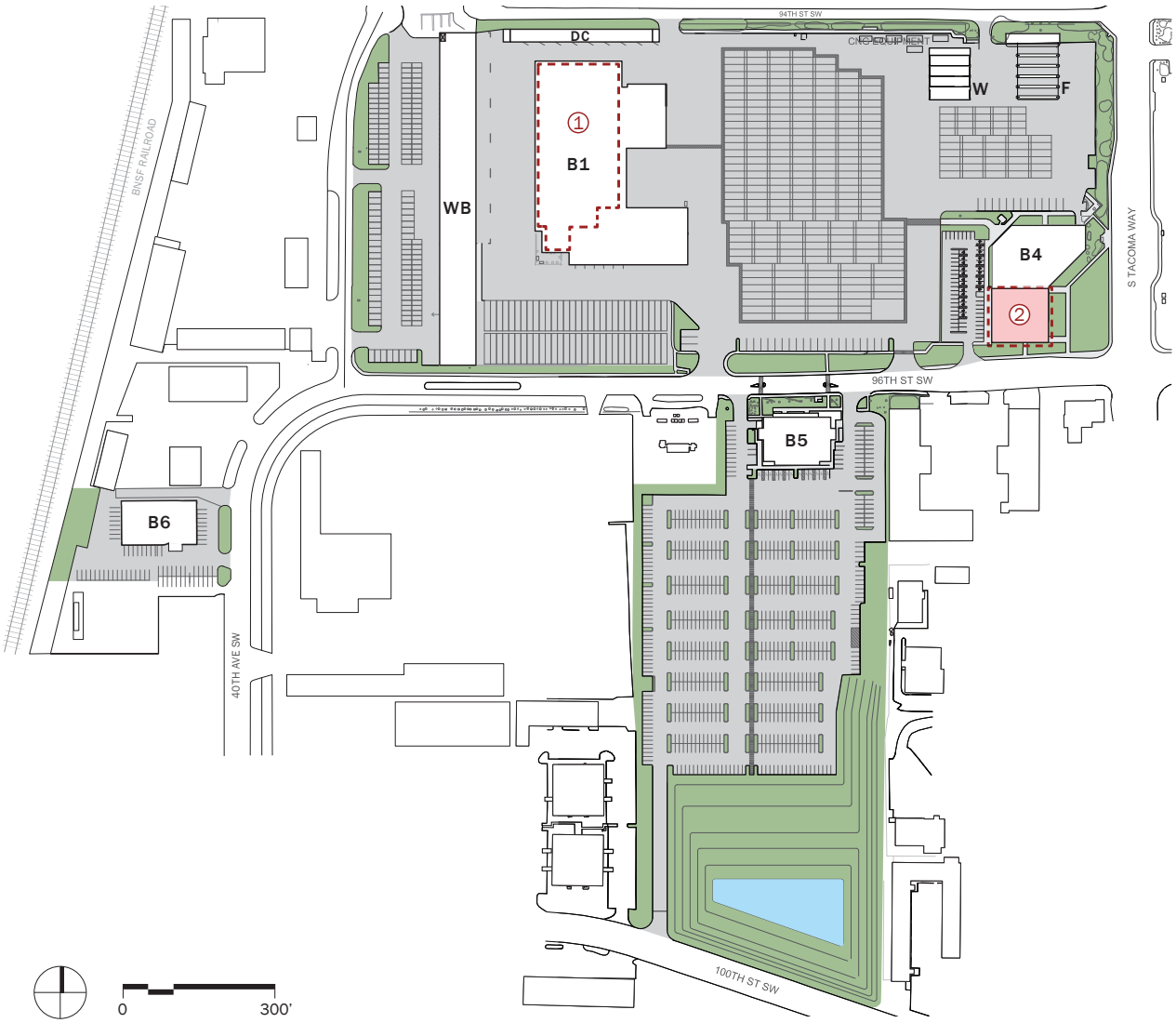
Workplace improvements proposed in Phase 2 will improve the administrative areas in both Buildings 4 & 5 and will reduce square-foot to employee ratios, but a long term addition of space is still required somewhere on the base to accommodate growth to 2040. In addition the age of Building 4 and its systems is close to 30 years old today and will be nearing the end of their useful life by the time this phase is reached.

- This project can be undertaken either in Phase 4 or Phase 2 and is independent of other on-base improvements.
- Completing this project sooner will reduce risk of damage during a catastrophic seismic event.

BUILDING 5 RENOVATION

Interior renovations in building 5 will be required as departments grow and change. This will provide an opportunity for refresh of interior finishes, lighting and other building components as they reach the end of their useful life.

- Renovation in both Building 5 & Building 4 will also provide opportunities for program consolidation and improved adjacencies.
- This project can be phased, and portions can take place during either phase 2 or phase 5.
- A programming study to develop a long term program plan for both buildings and addition should be undertaken to anticipate these needs.



COLOR LEGEND

- Building Footprint
- Project Boundary
- Pond
- Keynote (X)
- Landscape
- Paving
- New Building Area

PHASE 4

1. Building 1 Renovation
2. Building 4 Addition and Renovation

FIGURE 6-19 PHASE 4

6.4 BUDGET & COST

The goal of the Planning Study and the format are intended to provide flexibility for the agency as it makes future decisions. The Base Master Plan should be seen as a framework rather than a prescriptive approach.

All estimates are provided in 2017 dollars with an escalation factor applied corresponding with their position on the Implementation Schedule. Should the agency choose to re-order the sub-projects, the estimate can simply be re-escalated to the new date and schedule using the 2017 cost estimate.

CAPITAL COST ESTIMATE

The preliminary conceptual level cost estimate was developed based on the preferred alternative and implementation plan presented earlier in this report. The costs for each phase were identified and includes site work, paving, demolition, renovation, new construction and additions, equipment, furnishings, IT and technology, and emergency generators.

Below is a summary table with the estimated cost in 2017 dollars for each sub-project. These costs include a 35% factor for soft costs, a 20% contingency appropriate to the current level of development, and a 5% contingency for construction phasing.

- The detailed cost estimate by phase is shown in Appendix D.
- The cost estimate is also broken down by year and by phase to show the projected escalated project cost. The detail of this breakdown is shown in the Appendix D.

A summary is provided below showing the cost in 2017 dollars and the escalated cost based on the assumptions above and the Implementation Plan.

COST ESTIMATES	2017 Cost	Escalated from Cost by Year
Phase I	**$41,979,927**	**$45,667,939**
1A: Expand South Base Parking	$5,155,742	$5,414,138
1A: Building 4 Parking Improvements	$953,377	$1,007,549
1B: Expand Bus Parking + New Fuel & Wash + 6 Electric Bus Charging Stations	$20,742,792	$22,637,553
1B: Articulated Bus Bays Addition to Building 1	$6,253,470	$6,775,849
1B: Demo Public CNG & Build New Detail Clean Facility	$3,914,062	$4,293,785
1C: Bus Lot Reorientation & Restriping, Entry Improvements	$646,612	$718,743
1C: Regrade & Pave VSR, Bad Order, Surplus Parking	$4,331,939	$4,820,322
Phase 2	**$5,897,146**	**$6,882,592**
2A - Skybridge	$991,921	$1,131,534
2B - Building 4 Workplace Improvements	$4,905,225	$5,751,059
Phase 3	**$56,829,403**	**$70,250,405**
3A - Building 4 Renovation	$56,402,394	$69,721,701
3B - Building 4 Addition / Comprehensive Renovation	$427,008	$528,703
Phase 4	**$33,030,933**	**$42,674,264**
4A - Building 1 Renovation	$19,680,695	$25,070,362
4B - Building 4 Addition & Renovation	$9,666,675	$12,665,962
4C - Building 5 Renovation	$3,683,563	$4,937,940
TOTAL	**$137,737,408**	**$165,475,200**

ESTIMATE ASSUMPTIONS

The cost estimate developed is based on the following assumptions:

- Unit cost based on cost on similar recent projects adjusted for Tacoma area.
- Escalation at 3% per year to mid-point of construction based on Implementation Plan.
- Phase 1B includes six additional electric bus charging stations, but assumes transformers and switchgear is provided in current electric bus project.
- Construction cost includes 20% contingency plus 5% for construction phasing.
- Project cost equals construction cost plus 35% for soft cost, including 10% for taxes plus 5% for owner's contingency.
- IT and technology included except in Phase 3B.
- Furnishings allowances are included in Phases 2B, 4A, 4B, and 4C.
- Maintenance equipment allowance is included in Phases 1B, 3A, and 4A.
- Costs include site work, pavement, demolition, renovation, and new construction.
- Does not include:
    - Hazardous Materials remediation
    - Initial six electric bus charging stations
    - Existing paint booth refurbishment
    - Renovation of Building 6 (9622 40th Avenue SE facility)

OPERATING BUDGET IMPACTS

There are a number of factors that can impact operating cost on the site including bus circulation, safety, the driver's pre-trip inspection, and the nightly servicing cycle. While each of these is difficult to quantify, the following discussion is provided to address each item.

The preferred alternative provides bus circulation lanes that are a minimum of 65 to 70-feet wide, bus parking spaces that are 14'- 0" feet wide, and clearly defined bus traffic patterns. These three items combine to provide a much safer bus parking area and space to exercise the wheelchair ramp in place during the pre-trip inspection. More space for bus circulation will help reduce damage to buses such as damaged mirrors and minor body damage. Exercising the wheelchair ramps daily will extend their life by insuring that they work properly, thus improving service reliability for a critically important segment of Pierce Transit's riding public. Clearly defined traffic lanes and pedestrian circulation walkways will minimize personal injury. These items will combine to minimize operating cost from on-site operations.

Most of the nightly interior cleaning is done in the bus parking area due to the limited number of fuel positions currently on site. The preferred alternative provides five fuel lanes to accommodate a 6 to 7-minute dwell time for each bus. This will allow the interior cleaning to be done in the fuel position under controlled conditions. This also provides a safer environment to avoid personal injuries. The controlled conditions will allow for buses to be kept cleaner with less effort, which will improve service quality while minimizing impact on operating cost.

CONSTRUCTION IMPACTS

The Implementation Plan was developed to allow transit operations to continue throughout construction with as little disruption as possible. Each phase of construction was developed to minimize disruption to operations while also minimizing trade mobilization and demobilization. Clearly defined construction zones and minimizing mobilization/demobilization will help minimize construction time and cost.

PROJECT DELIVERY METHODS & BID PACKAGING

The following limited synopsis of delivery methods is provided to supplement the Implementation Schedule and is not intended to be a recommendation of any method, which would require further analysis. Comparative analysis of project delivery methods should be considered during the capital planning and budgeting process.

Design-Bid-Build

- Typically the lowest initial construction cost
- Contractor is selected based on cost, not qualifications
- Architect/contractor/owner relationship develops post-construction award
- Limited ability to deal with multiple construction phases, relocation of tenants, or work on multiple sites or base areas

General Contractor/Construction Manager (GCCM)

- Contractor is selected on qualifications with some cost factors
- Architect/contractor/owner relationship develops during the design phase
- Contractor provides cost estimating, value engineering and feasibility analysis
- Capacity to deal with multiple construction sites, phasing, tenant relocation and work on multiple areas of the base.

In the Implementation Schedule and proposed phasing, Phase 1 and Phase 3 are proposed as a GCCM project delivery process. This is because of their relative complexity, interrelation, or phasing. The remaining projects in Phase 2 and Phase 4 are assumed to be procured via a Design-Bid-Build method.

6.5 REVENUE VEHICLE CAPACITY ANALYSIS

As noted in the Site Analysis section, not all proposed base improvements directly increase vehicle capacity. The number of revenue vehicles that the base can support is a combination of three factors: parking capacity, maintenance capacity and fuel & wash capacity.

Each of these capacities can be calculated on a by phase or by project basis based on industry standards for decision making purposes. The base can operate at levels beyond these theoretical capacities as it does today, although that practice for prolonged periods of time may lead to safety or efficiency compromises.

Figure 6.21 below calculates the base revenue vehicle capacity in Vehicle Equivalents (VE) based on each of the three factors. Refer to the design criteria in the Site and Facilities Analysis sections for additional information on assumed industry standards for these items.

BASE CAPACITY	**Current Bus Parking** (North/South)			**Reoriented Bus Parking** (East / West)				
	2017							
Vehicle Equivalents: *40' bus = 1 VE* *60' bus = 1.5 VE*	(Actual) *Capacity 12' wide spaces w/narrow circulation*	(theoretical) *12' wide spaces w/ proper circulation*	(theoretical) *14' wide spaces w/ proper circulation*	**2017** (theoretical)	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**
Bus Parking Capacity Vehicle Equivalents (Note 1)	**327**	**294**	**263**	**274**	**321**	**321**	**321**	**321**
Bus Parking Capacity Vehicle Equivalents (Includes 15% in maintenance or bad order)	**376**	**338**	**302**	**315**	**369**	**369**	**369**	**369**
Bus Maintenance Capacity 1 bay per 10 Buses (Notes 2 and 3)	**250** (10 articulated)	**250** (10 articulated)	**250** (10 articulated)	**250** (10 articulated)	**250** (40 articulated)	**250** (40 articulated)	**250** (40 articulated)	**250** (40 articulated)
Fuel Capacity 1 fuel position per 75 buses (Note 4)	**225**	**225**	**225**	**225**	**375**	**375**	**375**	**375**
Wash Capacity 1 fuel position per 150 buses (Note 4)	**150**	**150**	**150**	**150**	**450**	**450**	**450**	**450**

Note 1: 321 bus parking capacity when Phase 1 is complete is a 17% increase over the existing capacity of 274 buses (assuming 14-foot-wide spaces and proper circulation aisles) in the same East/West orientation. Not including NRV/SHUTTLE/Vanpool Maintenance

Note 2: Not including body repair, paint, and chassis dynamometer
Not including NRV/SHUTTLE/Vanpool Maintenance

Note 3: The existing maintenance facility is significantly under-sized and can only accommodate articulated 10 buses

Note 4: The existing fuel & wash facility is severely undersized and requires nightly interior cleaning to be done in the yard under adverse conditions which is an ongoing safety concern

FIGURE 6-21 BASE CAPACITY ANALYSIS - EXISTING AND BY PHASE

6.6 AUTOMOTIVE CAPACITY ANALYSIS

Similar to the Revenue Vehicle capacity, automotive capacity can also be estimated by phase, depending on the area dedicated to parking, the parking lot concept layout and industry standards. The following table (Figure 6.22) tracks employee and non-revenue vehicle parking spaces by phase. These spaces shift locations as project are completed per the Concept Schedule. At each point in the Master Plan the available automotive parking is equal to or exceeds the parking needs identified in the program table.

	Main Base				South Base	West Base	Building 6	Total
	S. of Bldg 1	N. of Bldg. 4	S & W of Bldg. 4	At Bldg. 1 & 2*				
CURRENT								
Employee/ Visitor	84	162	12	0	212	0	0	**470**
Non-Revenue Vehicle (NRV)	0	43	0	43	6	27	0	**119**
Total (Current)	**84**	**205**	**12**	**43**	**218**	**27**	**0**	**589**
PHASE 1A								
Employee/ Visitor	84	205	24	0	327	0	9	**649**
Non-Revenue Vehicle (NRV)	0	0	43	43	33	0	0	**119**
Total (Phase 1A)	**84**	**205**	**67**	**43**	**360**	**0**	**9**	**768**
PHASE 1B								
Employee/ Visitor	84	0	24	0	630	0	9	**747**
Non-Revenue Vehicle (NRV)	0	0	43	43	33	0	0	**119**
Total (Phase 1B)	**84**	**0**	**67**	**43**	**663**	**0**	**9**	**866**
PHASE 1C								
Employee/ Visitor	0	0	24	0	630	0	9	**663**
Non-Revenue Vehicle (NRV)	0	0	43	43	33	0	0	**119**
Total (Phase 1C)	**0**	**0**	**67**	**43**	**663**	**0**	**9**	**782**
PHASE 2								
Employee/ Visitor	0	0	24	0	630	0	9	**663**
Non-Revenue Vehicle (NRV)	0	0	43	43	33	0	0	**119**
Total (Phase 2)	**0**	**0**	**67**	**43**	**663**	**0**	**9**	**782**
PHASE 3								
Employee/ Visitor	0	0	24	0	630	0	9	**663**
Non-Revenue Vehicle (NRV)	0	0	43	16	33	27	0	**119**
Total (Phase 3)	**0**	**0**	**67**	**16**	**663**	**27**	**9**	**782**
PHASE 4								
Employee/ Visitor	0	0	24	0	630	0	9	**663**
Non-Revenue Vehicle (NRV)	0	0	43	16	33	27	0	**119**
Total (Phase 4)	**0**	**0**	**67**	**16**	**663**	**27**	**9**	**782**

FIGURE 6-22 EMPLOYEE / NRV PARKING CAPACITY BY PHASE

Note that the highlighted projects in phase 1B: expansion of the bus parking, new fuel and wash, and the addition to Building 1 all directly impact base capacity, and when taken together provide the largest increase in base capacity over time. The only other direct impact comes from the new West Base facility in Phase 3.

All other projects either serve in a support role to base capacity or are necessary steps prior to the capacity increasing projects.

PHASE	IMPACTS (Red indicates capacity impact)
Phase I	1A: Expand South Base Parking
	1A: Building 4 Parking Improvements
	1B: Expand Bus Parking + New Fuel & Wash + 6 Electric Bus Charging Stations
	1B: Articulated Bus Bays Addition to Building 1
	1B: Demo Public CNG & Build New Detail Clean Facility
	1C: Bus Lot Reorientation & Restriping, Entry Improvements
	1C: Regrade & Pave VSR, Bad Order, Surplus Parking
Phase 2	2A - Skybridge
	2B - Building 4 Workplace Improvements
Phase 3	**3A - New West Base**
	3B - Demolish Building 2
Phase 4	4A - Building 1 Renovation
	4B - Building 4 Addition & Renovation
	4C - Building 5 Renovation

FIGURE 6-23 PROJECTS THAT DIRECTLY IMPACT BASE CAPACITY

7 APPENDIX

A. DETAILED SPACE PROGRAM TABLE

B. MAIN BASE VEHICLE CIRCULATION AND PARKING DIAGRAMS

C. PROJECT IMPLEMENTATION SCHEDULE

D. COST ESTIMATES AND COSTS BY YEAR

E. TRAFFIC STUDY

F. EXISTING STORMWATER SYSTEMS SUMMARY

G. SOUTH BASE FACILITY JARPA APPLICATION

H. ADDENDUM TO THE SOUTH BASE JURISDICTIONAL REPORT

I. INITIAL MASTER PLAN ALTERNATIVES

J. REFINED MASTER PLAN ALTERNATIVES

K. ALTERNATE FLEET GROWTH RATE TABLES

L. BUILDING 6 FACILITY UTILIZATION REPORT